

Appendix B

Boring and Test Pit Logs

Northwest Boundary Area RCRA Facility Investigation Fort Buchanan, Puerto Rico



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-01

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/1/2006

Date Completed: 12/4/2006

Depth of Hole (ft): 32.00

Boring/Well: MONITORING WELL

Elevation (ft): 33.23

Northing (m): 867063.26

Easting (m): 760469.08

UTM NAD83

Gauged Depth to Water (ft): 17.73

Conditions: Asphalt Perimeter Road

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	33	
-1			FILL-GP: Dark bluish gray (Gley 2, 4/1) med-coarse GRAVEL; some dark brown coarse sand; wet.				
-2			CL: Dark yellowish brown (10 YR 4/4) to dark brown (10 YR 3/3) CLAY; some silt, little organics, trace white coarse sand/fine gravel; very moist.				
-3							
-4			CL: Yellowish red/reddish brown (5 YR 4/6, 4/4) and gray (10 YR 6/1) CLAY; slightly stiff, very high plasticity; trace yellowish brown (10 YR 5/6) coarse sand; dry.		4-8	62	SB-03-06-01-4-8
-5							
-6							
-7							
-8			CL: Reddish brown/gray CLAY; some fine gravel and yellowish brown coarse sand; very wet (low recovery).		8-12	20	
-9							
-10							
-11							
-12			CL: Reddish brown/gray CLAY; highly plastic; dry.		12-16	71	
-13			SM: Gray/light bluish gray (Gley 2 7/1) and yellowish brown fine SAND and SILT; slightly moist.				
-14			SM: Brownish yellow (10 YR 6/8) and very pale brown (10 YR 7/3) fine SAND; little silt; slightly moist.				
-15			ML: Greenish gray (Gley 1 6/1) and brownish yellow SILT; little clay, trace fine sand, slightly moist.				
-16			ML: Brownish yellow SILT; trace clay.		16-20	88	
-17			OL: Reddish brown/brownish yellow/light brownish gray (10 YR 6/2) SILT; little black remnant organic material; trace clay.				
-18							
-19			CL: Dark yellowish brown (10 YR 4/6) and pale brown (10 YR 6/3) CLAY; little black silt (organics); medium plasticity, stiff, dry.				
-20			GP: Very pale brown medium GRAVEL and coarse SAND; some silt; little clay (carbonates); moist.		20-24	67	SB-03-06-01-20-24
-21							
-22			SM: Pale brown (10 YR 6/3), some brownish yellow fine SAND; little silt.				
-23			ML: Pale brown/brownish yellow SILT; trace fine sand.				
24							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-01

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-24			ML: Light greenish gray (Gley 1 7/1) some brownish yellow SILT; trace coarse sand/fine gravel. Slightly moist.		24-28	83	
-25							
-26							
-27							
-28			ML: Brownish yellow to light greenish gray SILT; trace fine sand; moist.		28-32	63	
-29							
-30			ML: Light greenish gray/pale brown SILT; some coarse sand, trace clay, wet.				
-31							
-32			END OF SAMPLING				
-33							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-02

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/6/2006

Date Completed: 12/7/2006

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 61.05

Northing (m): 866516.94

Easting (m): 760773.70

UTM NAD83

Depth to Water (ft): 19.55

Conditions:

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	41.7	SB-03-06-02-4-8
-1			GP: Pale red (10R 7/3) coarse GRAVEL; moist.				
-2			CL: Red (10R 4/6) and bluish gray (Gley 2 6/6) CLAY; high plasticity; little silt; dry.				
-3							
-4			CL: Red and bluish gray CLAY; highly plastic, trace silt and fine sand.		4-8	62.5	SB-03-06-02-4-8
-5							
-6							
-7							
-8			CL: Red/bluish gray CLAY; little silt; some plasticity. Dry.		8-12	100	SB-03-06-02-4-8
-9			CL: Yellowish brown/red/bluish gray CLAY and SILT; dry.				
-10			CL: Yellowish brown (10 YR 5/8), some light gray (10 YR 7/2) CLAY and SILT; little black organics; trace fine sand, dry.				
-11							
-12			SM: Very pale brown (10 YR 7/4) to brownish yellow/light gray fine SAND and SILT; more sandy at depth. Mostly dry.		12-16	91.7	BEGIN CARBONATE ZONE
-13							
-14			ML: Brownish yellow/black SILT; trace fine sand and clay.				
-15							
-16			ML: Grayish brown (10 YR 5/2), yellowish brown, black SILT and CLAY; low plasticity, dry.		16-19	100	BEGIN CARBONATE ZONE
-17			GM: Very pale brown (10 YR 7/4, 7/3) SILT; fine medium GRAVEL, and coarse SAND; dry.				
-18							
-19							
-20			GM: Very pale brown (little yellowish brown, light gray) medium GRAVEL, coarse SAND, and SILT; slightly moist to very moist.		20-22	100	BEGIN CARBONATE ZONE
-21							
-22							
-23							
-24							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-02

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-24			GM: Very pale brown (10 YR 8/2, 7/3) SILT and medium to coarse GRAVEL; dry.		24-24.9	100	END CARBONATE ZONE
-25							
-26			GM: Very pale brown fine to medium GRAVEL and SILT; slightly moist at depth.		26-27.67	100	SB-03-06-02-26-28
-27							
-28			SM: Light gray fine SAND; some silt, moist.				
-29			SM: Brownish yellow (10 YR 6/6) fine SAND and SILT; slightly moist.		28-31.67	100	
-30			OL: Brown (10 YR 5/3) to dark bluish gray (Gley 2 4/1) SILT; high amount of shells in bluish gray material; little fine gravel; trace clay. Dry.				
-31							
-32			OL: Dark bluish gray SILT; carbonate fragments. Dry.		32-33.67	100	CARBONATES
-33			GM: Greenish gray (Gley 2 6/1) and very pale brown fine to medium GRAVEL and SILT (carbonates); moist.				
-34							
-35			SP: Very pale brown fine to medium SAND; some fine to medium gravel, little silt near bottom of interval. Wet.		35-37	100	
-36							
-37							
-38			SP: Very pale brown/reddish brown fine SAND; little medium gravel, trace silt. Wet.		38-39.67	100	
-39			SM: Light greenish gray fine SAND and SILT; moist.				
-40			ML: Dark bluish gray SILT; trace clay; stiff, mostly dry.				
-41							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-3

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/20/2006

Date Completed: 10/24/2006

Depth of Hole (ft): 90.00

Boring/Well: BOREHOLE

Elevation (ft): 36.87

Northing (m): 867219.90 Easting (m): 760997.56 UTM NAD83

Depth to Water (ft): N/A

Conditions: Asphalt between light poles 053/054

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Asphalt		0-4	50		
-1			GP: Very dark gray, round GRAVEL and coarse SAND (aggregate); moist.				6/6	
-2			CL: Reddish brown (5 YR 4/4) CLAY; little white clay, trace silt. Stiff.				7/12	
-3							10/12	
-4			CL: Strong brown (7.5 YR 5/6, 5/8) CLAY; little silt, little fine gravel, trace sand; striations of black clay/silt. Stiff.		4-8	50	16/12	SB-03-06-03-4-8
-5							7/12	
-6							7/12	
-7							18/12	
-8			CL: Pinkish white (5 YR 8/2) CLAY with regular intervals of reddish brown (5 YR 4/4) SILT and fine GRAVEL; very stiff. Dry.		8-12	79	31/12	
-9							19/12	
-10							29/12	
-11							38/12	
-12			CL: Pinkish white (2.5 YR 8/2) and red (2.5 YR 4/6) CLAY; trace silt. Very stiff, dry.		12-16	73	39/12	
-13							11/12	
-14							18/12	
-15							23/12	
-16			CL: Strong brown (7.5 YR 5/6) with black mottles CLAY; trace silt. Very stiff, dry.		16-20	100	28/12	
-17							9/12	
-18							18/12	
-19							23/12	
-20			CL: Strong brown (7.5 YR 5/1) CLAY; stiff.		20-24	100	30/12	SB-03-06-03-20-22
-21							4/12	
-22			GM: Very pale brown (10 YR 8/2) SILT and fine GRAVEL; trace fine sand, slightly moist.				32/12	
-23							46/12	
-24			SP: Brownish yellow (10 YR 5/6) fine SAND; trace silt, moist.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-3

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-24			SP: Brownish yellow fine SAND; moist.		24-26.75	91	55/12	
-25			ML: Pale yellow (2.5 Y 7/3) and brownish yellow SILT; some clay; slightly stiff; trace fine gravel and sand. Slightly moist.				19/12	
-26							27/12	
-27							100/9	
-28			GM: Very pale brown (10 YR 8/4) to yellow (10 YR 7/6) medium to coarse GRAVEL; some silt, tapering to stiff CLAY and GRAVEL; some silt, little medium sand. Moist.		28-32	79	63/12	
-29							46/12	
-30							39/12	
-31								
-32			GC: Pale brown (10 YR 8/4) CLAY and medium to coarse GRAVEL; trace medium sand. Very moist.		32-33.67	100	45/12	
-33			GM: Pale brown medium to coarse GRAVEL; some medium sand, little clay; very moist.				43/12	
-34							100/8	
-35								
-36			CL: Very pale brown (10 YR 8/3) CLAY and fine to medium GRAVEL; little medium sand, very moist.		36-36.67	100	100/8	
-37								
-38			SM: Brownish yellow (10 YR 6/6) and light gray (10 YR 7/1) medium SAND and SILT; little clay, trace fine gravel. Very moist.		38-38.5	100	100/6	
-39								
-40			GP: Very pale brown medium angular GRAVEL and medium SAND; wet.		40-43.5	100		
-41			SM: Yellowish brown fine SAND and SILT; moist.				38/12	
-42			ML: Dark bluish gray (Gley 2 4/1) and yellowish brown SILT; trace clay. Slightly moist.				33/12	
-43			OL: Dark bluish gray SILT; some small gravel and shells. Trace clay, very stiff. Dry.				58/12	
-44			GP: Dark bluish gray shells (medium GRAVEL); wet.		44-44.5	100	100/5	
-45							100/6	
-46			SM: Greenish gray (Gley 2 6/1, 5/1) fine SAND; little clay, trace silt. Wet.		46-47.75	100		
-47			SM: Greenish gray fine SAND and SILT; trace clay, trace medium gravel. Very moist.				74/12	
-48							100/9	
-49								
-50			GC: Greenish gray medium GRAVEL; some silt and medium sand; little clay. Stiff, moist.		50-50.5	100	100/5	
-51								
-52			SM: Greenish gray fine SAND; some silt, some clay, trace fine gravel, moist.		52-52.8	100		
-53								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-3

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-54			GP: Greenish gray medium SAND and fine GRAVEL; trace clay and silt. Wet.		54-54.6	100	100/10	
-55							100/7	
-56			ML: Greenish gray SILT; some fine sand, trace fine to medium gravel. Moist, stiff.		56-57.2	100		
-57							100/12	
-58								
-59								
-60			ML: Light greenish gray (Gley 2, 7/1) SILT; little clay, trace medium sand, fine gravel.		60-60.5	100		
-61							100/5	
-62			OL: Light greenish gray SILT; little white fragments (carbonates). Very stiff.		62-62.5	100		
-63							100/6	
-64			ML: Light greenish gray SILT; very stiff.		64-65	100		
-65			ML: Dark greenish gray SILT; some fine to medium gravel, trace clay, very stiff.				100/12	
-66			ML: Dark greenish gray SILT; trace fine gravel.		66-66.5	100		
-67							100/6	
-68			GM: Dark greenish gray SILT and medium GRAVEL; trace fine sand.		68-69.25	100		
-69			ML: Dark greenish gray SILT; little fine sand.				27/6	
-70			ML: Very dark greenish gray (10 YR 3/1) SILT; some medium gravel at depth.		70-70.8	100	100/6	
-71			CL: Dark greenish gray CLAY; some silt, trace fine sand.				86/6	
-72			ML: Dark greenish gray SILT; little fine sand, trace gravel.		72-73.67	100	100/4	
-73							46/6	
-74			GM: Dark greenish gray SILT, medium SAND, and medium GRAVEL; moist.		74-74.67	100	52/6	
-75							85/6	
-76			SM: Dark greenish gray SILT and fine to medium SAND; moist.		76-77	100	100/6	
-77							50/6	
-78			SM: Dark greenish gray fine to medium SAND; some silt; very moist.		78-78.75	0.5	100/6	
-79							28/6	
-80			ML: Dark greenish gray (Gley 2 4/1) SILT; trace clay and medium gravel; stiff. Moist.		80-80.9	100	100/3	
-81							69/6	
-82			OL: Dark greenish gray SILT, trace clay, stiff. Evidence of		82-82.67	100	100/5	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **SB-3**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-83			calcium carbonates; slightly moist.				100/6	
-84			OL: Dark greenish gray SILT and CLAY; high amount of shell fragments (carbonates); very stiff, mostly dry.		84-85	100	38/6 100/6	
-85								
-86			OL: Dark greenish gray SILT; some clay, trace fine gravel, trace carbonates. Very stiff, dry.		86-87.25	100	54/6 47/6 100/3	
-87								
-88			OL: Dark greenish gray SILT; some fine gravel. Dry.		88-88.5	100	100/5	
-89								
-90								
-91								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-03A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/27/2006

Date Completed: 10/27/2006

Depth of Hole (ft): 33.00

Boring/Well: MONITORING WELL

Elevation (ft): 36.49

Northing (m): 867224.75 Easting (m): 761011.49 UTM NAD83

Depth to Water (ft): 26.80

Conditions: Asphalt between light poles 054/055

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24			SM: Very pale brown (10 YR 7/3) fine SAND; little silt. Moist.		24-28	21	
-25			ML: Brownish yellow (10 YR 6/6) SILT; little clay. Low stiffness, moist.				
-26							
-27							
-28							
-29							
-30			GM: Very pale brown to light gray (10 YR 7/2) fine to medium GRAVEL; some coarse sand and silt, trace clay. Calcium carbonates. Wet to moist, very stiff at bottom.		29-33	100	
-31							
-32							
-33							
-34							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-03B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/25/2006

Date Completed: 10/26/2006

Depth of Hole (ft): 55.00

Boring/Well: MONITORING WELL

Elevation (ft): 36.22

Northing (m): 867219.90 Easting (m): 760997.56 UTM NAD83

Depth to Water (ft): 14.65

Conditions: Asphalt between light poles 053/054

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31							
-32							
-33							
-34							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-03B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-35							
-36							
-37							
-38							
-39							
-40							
-41							
-42							
-43							
-44							
-45							
-46	☒	☒	GM: Greenish gray (Gley 2 5/1) medium GRAVEL; some coarse sand and silt; white carbonates. Moist.		45-45.67	100	
-47	☒	☒					
-48	☒	☒	GP: Light greenish gray (Gley 2 7/1) medium to coarse GRAVEL and coarse SAND; trace/little silt. Wet.		47-48.33	100	
-49	☒	☒	SM: Greenish gray fine SAND; some silt. Very moist.				
-50	☒	☒	GM: Light greenish gray medium to coarse GRAVEL; some sand and silt.		49-49.5	100	
-51	☒	☒	GW: Light greenish gray coarse GRAVEL; wet.				
-52	☒	☒	ML: Dark greenish gray (Gley 2 4/1) SILT; some coarse sand and fine gravel; calcium carbonates. Moist.		51-52	100	
-53	☒	☒	GM: Greenish gray fine to medium GRAVEL; some silt; trace medium sand. Moist.				
-54	☒	☒	GM: Greenish gray medium SAND and fine GRAVEL; some silt; calcium carbonates. Moist.		53-54	50	
-55	☒	☒	GM: Greenish gray SILT; some fine to medium gravel, little medium sand. Stiff, moist.				
-56							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-04A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/30/2006

Date Completed: 11/30/2006

Depth of Hole (ft): 41.00

Boring/Well: MONITORING WELL

Elevation (ft): 42.00

Northing (m): 867307.44

Easting (m): 761301.34

UTM NAD83

Depth to Water (ft): 32.14

Conditions:

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31							
-32			SM: Light greenish gray (Gley 1 7/1), light gray (10 YR 7/2) and brownish yellow (10 YR 6/8) very fine SAND and SILT; slightly moist.		31-34	100	
-33							
-34			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/6) SILT; little clay; little white gravel, more at depth. Very stiff. Mostly dry.				
-35					35-38.5	88	
-36			GM: Pale brown (10 YR 6/3) to very pale brown (10 YR 8/2) medium to coarse GRAVEL, SILT, and medium SAND; trace clay, moist to wet.				
-37							
-38			GP: Brownish yellow (10 YR 6/6) coarse GRAVEL; little medium sand. Wet.				
-39					39-41	92	
-40			GP: Very pale brown (10 YR 7/4) to yellow (10 YR 7/6) coarse SAND and medium GRAVEL; little silty clay. Wet.				
-41							
-42			GM: Pale brown fine to medium GRAVEL and SILT; little coarse sand, trace clay. Fairly stiff, moist.				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-04B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/13/2006

Date Completed: 11/30/2006

Depth of Hole (ft): 69.00

Boring/Well: MONITORING WELL

Elevation (ft): 41.88

Northing (m): 867304.94

Easting (m): 761290.88

UTM NAD83

Depth to Water (ft): 18.71

Conditions: Asphalt between light poles 054/055

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	60	
-1			CL: Dark yellowish brown (10 YR 4/4) with reddish blue mottled CLAY; trace fine gravel.				
-2							
-3							
-4			CL: Dark yellowish brown CLAY with red, blue, and green striations/mottles; trace wood fragments and silt. Strong gasoline odor, especially in greenish-blue silty material.	35	4-8	62.5	SB-03-06-04-4-8
-5				157			
-6				150			
-7				200			
-8			CL: Dark yellowish brown/greenish gray (Gley 2 6/1) CLAY; mottled with reds, dark browns; trace reddish silt; trace fine gravel.	97	8-12	88	
-9				5			
-10							
-11							
-12			CH: Dark yellowish brown mottled CLAY; highly plastic, with reds, blues, greenish-grays; trace fine gravel.		12-16	83	
-13							
-14			SC-SM: Yellowish red (5 YR 4/6), brownish yellow (10 YR 6/6), and white CLAY and SAND; more sand at depth; little silt. Stiff, cement-like.				
-15							
-16			CL: Yellowish red to strong brown (7.5 YR 5/6) CLAY; some silt; trace fine white sand. Very stiff, low plasticity, dry.		16-20	96	
-17							
-18							
-19							
-20			ML: Yellowish red (5 YR 4/6) SILT; some clay, trace fine sand. Stiff.		20-24	100	
-21							
-22			CL: Yellowish brown (10 YR 5/8) and white CLAY with some yellowish red silt; stiff, medium plasticity.				
-23							
24							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-04B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-24			ML: Yellowish brown/yellowish red (5 YR 5/8) SILT and CLAY; very stiff, trace fine sand.		24-28	100	
-25							
-26			ML: Yellowish red SILT; some fine sand; some yellowish brown silt and sand.				
-27			CL: Yellowish brown CLAY; some yellowish red clay; trace black organics (silt); stiff, medium plasticity.				
-28			CL: Yellowish brown (10 YR 5/8) CLAY; some silt; little fine white sand; little black silty clay. Stiff.		28-32	100	
-29							
-30			ML: Very pale brown/yellowish brown SILT; some clay, little fine gravel.				
-31			SP: Light gray (10 YR 7/2) fine SAND; some yellowish brown sand, trace silt. Slightly moist.				
-32			SM: Light gray, some yellowish brown fine SAND and SILT.		32-35.5	100	SB-03-06-04-32-36
-33			ML: Light gray/yellowish brown SILT; little clay, trace fine white gravel.				
-34							
-35			GM: Light gray/white SILT and GRAVEL; slightly moist.				
-36					36-37.67	100	
-37			GM: Very pale brown (10 YR 7/3, 7/4) medium GRAVEL and coarse SAND; little silt; trace clay increasing to some silt/clay at depth. Very moist/wet.				
-38							
-39							
-40			GM: Very pale brown (10 YR 7/3) medium GRAVEL; some silt, little coarse sand. Very moist.		40-43	100	
-41			ML: Very pale brown/yellowish brown to greenish gray (Gley 1 6/1) SILT; little fine gravel; trace clay. Very stiff, slightly moist.				
-42							
-43							
-44			ML: Pale green/grayish green (Gley 1 6/2, 5/2) SILT; trace clay; stiff. Dry.		44-46.5	100	
-45							
-46			ML: Pale green/grayish green SILT; little fine gravel. Dry.				
-47							
-48			GM: Very pale brown (10 YR 8/2) medium GRAVEL; some coarse sand; little silt. Wet.		48-48.75	100	
-49							
-50			GM: Light brownish gray (10 YR 6/2) fine GRAVEL and medium SAND; little silt. Wet.		50-50.5	100	
-51							
-52			OL: Greenish gray (Gley 2 5/1) SILT; some shells, trace clay; stiff, dry.		52-53.6	100	
-53							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-04B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-54			GM: Coarse greenish gray GRAVEL; some silt. Very moist.		54-54.5	100	
-55			OL: Greenish gray SILT; trace white shells and clay. Slightly moist.				
-56			GM: Light greenish gray fine to medium GRAVEL; some coarse sand; little silt; very moist.		56-56.8	100	
-57			ML: Bluish gray (Gley 2 5/1) SILT; some fine sand, very moist.				
-58			SM: Dark greenish gray (Gley 2 4/1) fine SAND; little silt. Wet.		58.8	100	
-59			GP: Dark greenish gray medium GRAVEL; little fine sand, trace silt. Wet.				
-60			GM: Dark greenish gray (Gley 2 4/1) fine to medium GRAVEL and SILT; little fine sand; moist.		60-60.5	100	
-61			GM: Bluish gray (Gley 2 6/1) fine to medium GRAVEL; some silt, little fine sand. Slightly moist.				
-62			GM: Greenish gray (Gley 2 5/1) fine GRAVEL, medium SAND, and SILT. Moist.		62-62.8	100	
-63							
-64			GP: Light greenish gray (Gley 2 7/1) coarse GRAVEL; trace coarse sand and silt. Slightly moist.		64-64.5	100	
-65							
-66			ML: Light greenish gray SILT; some fine gravel, little coarse sand, slightly moist.		66-66.67	100	
-67							
-68			ML: Light greenish gray SILT; some medium to coarse gravel, trace medium sand, clay. Slightly moist.		68-68.67	100	
-69							
-70							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-05A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/10/2006

Date Completed: 11/10/2006

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 38.10

Northing (m): 867702.22

Easting (m): 761461.54

UTM NAD83

Depth to Water (ft): 32.47

Conditions: Asphalt between light poles 057/058

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31	☒	☒	GM: Light gray (10 YR 7/2) and very pale brown (10 YR 7/4) medium GRAVEL; some medium to coarse sand; some silt, little clay. Dry.		30-32.2	100	
-32	☒	☒					
-33	☒	☒					
-34	☒	☒	GP: Very pale brown medium GRAVEL; some coarse sand; little silt, little yellowish brown (10 YR 5/8) silt; trace clay. Wet.		34-38	54	
-35	☒	☒					
-36	☒	☒					
-37	☒	☒					
-38	☒	☒					
-39	☒	☒	GP: Very pale brown, yellowish brown medium to coarse angular GRAVEL; some coarse sand; little silt. Wet.		38-40	50	
-40	☒	☒					
-41			END OF SAMPLING				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-05B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/7/2006

Date Completed: 11/9/2006

Depth of Hole (ft): 70.00

Boring/Well: MONITORING WELL

Elevation (ft): 37.85

Northing (m): 867716.60 Easting (m): 761458.35 UTM NAD83

Depth to Water (ft): 23.35

Conditions: Asphalt between light poles 57/58

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	54	
-1			CL-ML: Dark yellowish brown (10 YR 4/4) CLAY and SILT, stiff; trace gravel. Slightly moist				
-2			ML: Yellowish brown (10 YR 5/8) SILT; little clay, little reddish silt.				
-3							
-4			ML: Strong brown (7.5 YR 5/8) mottled with reddish brown (5 YR 4/4), pinkish gray (5 YR 7/1) SILT; some clay; very stiff, dry.		4-8	89.6	SB-03-06-05-4-8 06-NO-08-DP
-5							
-6							
-7							
-8			ML: Alternating, some mottling, of reddish brown, yellowish brown, and white (10 YR 8/1) SILT; some clay (mostly white-colored material). Very stiff, dry.		8-12	83	
-9							
-10							
-11							
-12			CL-ML: Strong brown SILT and CLAY to white CLAY to reddish brown SILT; very stiff, dry.		12-16	100	
-13			OL: Yellowish brown SILT and CLAY; little black organics, trace gravel. Very stiff, dry.				
-14			CL-ML: White CLAY with interbedded reddish brown SILT; very stiff, dry.				
-15							
-16			CL: Mottled/striated yellowish brown/reddish brown/white CLAY; little silt. Stiff, dry.		16-20	100	
-17			OL: Yellowish brown SILT and CLAY; little black remnant organics; trace fine sand, stiff, dry.				
-18							
-19			OL: Yellowish brown SILT; some clay; little fine sand; trace black remnant organics. Dry.				
-20			OL: Brownish yellow (10 YR 6/8) SILT; some clay, trace black remnant organics.		20-24	100	
-21			OL: Dark yellowish brown (10 YR 4/4) to brownish yellow SILT; little clay, little black silt. Stiff, dry.				
-22			GM: Light gray (10 YR 7/2) to very pale brown (10 YR 7/3) SILT and fine to medium GRAVEL; little fine medium sand				

Note: Unless otherwise noted VOC reading = 0.



Log of Boring: **MW-05B**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-23			SILT and fine to medium GRAVEL; little fine medium sand (carbonate sands/gravel.)				BEGIN CARBONATE ZONE
-24			GM: Light gray to very pale brown fine to medium GRAVEL and SILT; very brittle; little medium sand, trace clay. Dry. (Carbonates)		24-28	89.6	
-25							
-26							SB-03-06-05-28-32
-27							
-28			GM: Light gray/very pale brown fine to medium GRAVEL; some silt, some medium sand, trace clay. Dry. (carbonates)		28-32	100	
-29							
-30			GM: Very pale brown medium GRAVEL; some silt, some medium sand, little clay. Slightly moist (carbonates)				
-31							
-32			SP: Very pale brown/light gray medium to coarse SAND; some coarse gravel, little clay, trace silt. Very moist, wet. (carbonates)		32-36	50	
-33							
-34							
-35							END CARBONATE ZONE
-36			GP: Very pale brown medium GRAVEL; some medium to coarse sand, little silt, wet. (Carbonates)		36-40	75	
-37							
-38			GM: Yellowish brown SILT and coarse GRAVEL; some clay; moist.				
-39							
-40			GM: Brownish yellow (10 YR 6/6) medium to coarse GRAVEL and SILT; little clay. Very moist.		40-44	50	
-41							
-42							
-43							
-44			CL: Dark yellowish brown (10 YR 4/6) CLAY, some silt, moist.		44-47	100	
-45			CL-ML: Light gray (10 YR 7/2) and very pale brown (10 YR 7/3) CLAY and SILT; little fine gravel. Slightly moist, stiff.				
-46							
-47							
-48			ML: Very pale brown SILT; some fine to medium gravel and clay; slightly moist, stiff.		48-51	61	
-49			SM: Brownish yellow/very pale brown fine SAND and SILT;				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-05B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-50			trace clay, slightly moist. Dense.				
-51							
-52			SW: Greenish gray (Gley 1 6/1) and some brownish yellow fine SAND; little silt, trace clay. Slightly moist.		52-55.67	100	
-53			CL-ML: Brownish yellow/greenish gray CLAY and SILT; little fine sand, trace purplish clay.				
-54			SM: Greenish gray/brownish yellow fine SAND and SILT. Moist.				
-55			CL: Brownish yellow CLAY. Moist.				
-56			GM: Medium to coarse very pale brown GRAVEL; some medium sand, little silt. Wet. (carbonates)		56-58.5	100	CARBONATE ZONE
-57			GM: Greenish gray (Gley 1 6/1) and very pale brown SILT, CLAY, and fine GRAVEL. Very stiff. Dry (carbonate).				
-58							
-59							
-60			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; little clay, little fine sand. Slightly moist, fairly stiff.		60-62	100	
-61							
-62			ML: Greenish gray SILT; little fine sand, trace iron oxides.		62-64	100	
-63			SW: Light yellowish brown (10 YR 6/4) fine SAND; wet.				
-64			SM: Greenish gray SILT and yellowish brown fine SAND; very moist.		64-65.67	90	
-65			SW: Greenish gray/light yellowish brown fine SAND; little silt. Very moist.				
-66			ML: Yellowish brown SILT; little clay and fine sand. Moist.		66-66.5	100	
-67							
-68			OL: Very dark gray (10 YR 3/1) SILT; little fine sand, trace clay; trace shells. Stiff.		68-69.67	100	
-69							
-70							
-71							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-06A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/6/2006

Date Completed: 11/7/2006

Depth of Hole (ft): 20.00

Boring/Well: MONITORING WELL

Elevation (ft): 13.53

Northing (m): 868268.25 Easting (m): 761468.57 UTM NAD83

Depth to Water (ft): 3.60

Conditions: Asphalt between light poles 060/061

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8			ML: Strong brown (7.5 YR 5/6) SILT; little reddish silt; trace black gravel, trace clay, trace fine sand.		8-12	83	
-9			ML: Strong brown/dark reddish brown (5 YR 3/4) SILT; some yellowish brown; trace white clay. Stiff material, fairly dry.				
-10							
-11							
-12			CL-ML: Yellowish/reddish SILT and white CLAY; lenses of medium sand, fine gravel at lower end of sample; some black organics; wet at depth.		12-16	100	
-13							
-14							
-15							
-16			CL: Strong brown CLAY; little reddish silt; little fine black gravel at bottom.		16-20	100	
-17			CL: Light greenish gray (Gley 2 7/1) CLAY; little reddish mottles of silt; trace fine gravel.				
-18							
-19			CL-ML: Yellowish brown (10 YR 5/6) CLAY and SILT; little light greenish gray clay.				
-20			END OF SAMPLING				
-21							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-06B

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment:

Drill Type: HSA

Date Started: 11/2/2006

Date Completed: 11/3/2006

Depth of Hole (ft): 67.00

Boring/Well: MONITORING WELL

Elevation (ft): 13.25

Northing (m): 868277.70 Easting (m): 761473.77 UTM NAD83

Depth to Water (ft): 8.23

Conditions:

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	44	SB-03-06-06-4-8
-1			GP: Dark bluish gray fine to coarse GRAVEL; some coarse sand, little silt. Dry.				
-2			CL: Dark yellowish brown (10 YR 4/4 CLAY; some mixed gravel, brick (fill). Dry.				
-4			CL: Dark yellowish brown CLAY; little dark blue gravel; trace sand. Stiff. Dry.		4-8	42	
-5			CL-ML: Dark greenish gray (Gley 2 4/1) CLAY and SILT; little yellowish brown sand, moist. Some organics				
-6			ML: Yellowish brown (10 YR 5/8) SILT, some clay; trace fine sand. Dry.				
-8			NS: NO RECOVERY, HIGH AMOUNT OF WATER IN HOLE		8-12	0	
-12			CL-ML: Alternating layers of yellowish brown/reddish brown (5 YR 4/4) SILT with white CLAY; fairly regular intervals; more silty than clay. Trace gravel. Stiff, dry.		12-16	94	
-16			CL-ML: Striated yellowish brown SILT; some red silt, little white clay, trace black silt (old organic matter).		16-20	100	
-20			GW: Coarse light gray/brown GRAVEL.		20-24	31	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-06B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-21			SM: Yellowish brown (10 YR 5/6) and black fine to medium SAND and SILT. Moist.				
-22			OL: Yellowish brown/black SILT; little fine sand.				
-23			CL-ML: Yellowish brown/reddish brown (5 YR 4/4) SILT; some white clay, trace fine sand.				
-24			NS: NO RECOVERY. SPOON COLLECTED REMAINING CLAY FROM PREVIOUS SAMPLE. COARSE GRAVEL FRAGMENT AT BOTTOM OF SPOON.		24-28	0	
-25							
-26							
-27							
-28			CL-ML: Brownish yellow (10 YR 6/6) CLAY and SILT mottled with reds, blacks, and whites (blacks likely remnant organics). Very stiff.		28-32	100	
-29							
-30							
-31							BEGIN CARBONATE ZONE
-32			ML: Yellow (10 YR 7/6) SILT, grading to very pale brown SILT, trace fine gravel (carbonates).		32-36	100	SB-03-06-06-32-36
-33			CL-ML: Very pale brown (10 YR 7/3, 8/2) little black SILT and CLAY; trace fine gravel.				
-34			GM: Very pale brown fine to coarse GRAVEL and SILT; little clay, trace medium sand (carbonates). Moist.				
-35							
-36			GM: Very pale brown fine to medium GRAVEL and SILT; trace clay, trace medium sand. Moist.		36-40	67	
-37							
-38			GM: Very pale brown fine to medium GRAVEL; some silt, some medium sand. Very moist (carbonates).				
-39							
-40			GM: Very pale brown fine to medium GRAVEL and SILT; little coarse sand, trace clay.		40-44	71	
-41			OL: Yellowish brown (10 YR 5/6) SILT; some black silt (organics); little clay.				
-42			GP: Very pale brown medium to coarse GRAVEL; some coarse sand, trace silt.				
-43			OL: Yellowish brown SILT; some black silt, little clay.				
-44			GP: Yellowish brown coarse GRAVEL; little silt.				
-45			GM: Yellowish brown to very pale brown fine to coarse GRAVEL and SILT; trace sand and clay, more sand at bottom of spoon. Moist (carbonates).		44-45.7	100	



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-06B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-46							
-47							
-48			GM: Very pale brown fine to medium GRAVEL; some silt, trace clay and sand.		48-52	62.5	
-49			GP: Yellowish brown medium angular GRAVEL; little coarse sand, wet.				
-50			ML: Very pale brown SILT; some fine to medium sand, trace fine gravel. Moist.				
-51							
-52			GM: Yellowish brown to very pale brown GRAVEL and SILT; very moist.		52-52.67	100	
-53			ML: Very pale brown SILT; stiff, dry.				
-54			ML: Light gray (10 YR 7/2) to very pale brown SILT; little fine gravel. Stiff.		54-55.5	100	
-55							
-56			ML: Light gray SILT; stiff; little/trace medium sand.		56-58	100	
-57							
-58			ML: Yellowish brown/light gray SILT; trace clay, stiff.				
-59			GM: Light gray SILT and fine GRAVEL/coarse SAND. Moist.		58-58.85	100	
-60							
-61			GM: Very pale brown (10 YR 7/3) and light gray (10 YR 7/2) medium GRAVEL; some coarse sand and silt. Moist. (Carbonates)		60-60.67	100	
-62			ML: Light gray SILT; some fine gravel; some coarse sand, trace clay. Moist.		62-62.85	100	
-63							
-64			ML: Light gray SILT; some medium gravel.		64-64.85	100	
-65			GM: Light greenish gray (Gley 2 7/1) to greenish gray (Gley 2 6/1) SILT and fine GRAVEL; grading to SILT; little gravel. Moist to dry.				
-66			ML: Greenish gray SILT; some fine to medium gravel/coarse sand. Dry.		66-67	100	
-67			END OF SAMPLING				
-68							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **SB-7**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: IVAN

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/10/2006

Date Completed: 10/13/2006

Depth of Hole (ft): 90.00

Boring/Well: BOREHOLE

Elevation (ft): 9.61

Northing (m): 868796.37 Easting (m): 761825.39 UTM NAD83

Depth to Water (ft):

Conditions: Asphalt between light poles 063/064

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Asphalt					
-1			GP: Fine to Coarse subangular GRAVEL; some medium gray (10 YR 5/1) sand; wet.		0.5-2	55	7/6	
-2			CL: Yellowish brown (10 YR 5/6) CLAY; some medium to coarse sand; trace gravel; wet.		2-3.5	33	8/6	
-3							7/6	
-4			CL: Gray (2.5 Y 5/1) CLAY; fairly stiff; trace fine to medium sand.		3.5-5	78	8/6	
-5							10/6	
-6					5-6.5	78	12/6	SB-03-06-07-5-6
-7			CL: Gray to yellowish brown (10 YR 5/4) CLAY; soft.		8	6.5-8	2/6	
-8							2/6	
-9			CL: Gray yellowish brown, brownish yellow (10 YR 6/6) CLAY; soft.		8-9.5	94	2/6	
-10			CH: Mottled yellowish brown, reddish brown (5 YR 4/4) CLAY; stiff; some dark yellowish brown clay.		9.5-11	94	4/6	
-11							4/6	
-12			CH: Highly mottled (Gley 2 7/1) bluish gray, reddish brown, black CLAY; trace weathered rock (sand). Medium stiffness, fairly plastic.		11-12.5	39	3/6	
-13			CH: Light bluish gray (Gley 2 7/1) CLAY; yellowish brown (10 YR 5/4) clay, trace sand. Medium stiffness, fairly plastic.		12.5-14	89	1/6	
-14							1/6	
-15			CL: Light bluish gray CLAY; trace silt. Stiff.		14-15.5	55	2/6	
-16					15.5-17	67	2/6	SB-03-06-07-16-17
-17							3/6	
-18			CL: Strong brown (7.5 YR 4/6) CLAY; some light bluish gray; grading to brown clay, some silt; trace fine gravel. Stiff.		17-18.5	89	3/6	
-19							3/6	
-20			CL: Brown (7.5 YR 4/6) stiff CLAY; some silt; trace fine gravel/coarse sand, very dark grayish brown (10 YR 3/2), more sand at depth.		18.5-20	78	5/6	
-21							7/6	
-22			CL: Brown CLAY, some silt, trace fine gravel grading to yellowish brown (10 YR 5/6) clay, little sand. Very stiff.		20-21.5	78	10/6	
					21.5-23	78	3/6	
							6/6	
							9/6	
							4/6	



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-7

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-23			CL: Yellowish brown and light bluish gray CLAY; stiff; little silt, trace organics.		23-24.5	83	6/6 6/6 2/6	
-24							4/6	
-25			CL: Light brownish gray (10 YR 6/2) to brown CLAY; trace fine gravel/coarse sand; stiff; some fine sand at bottom of interval.		24.5-26	78	6/6 3/6 4/6	
-26			SC: Light brownish CLAY and SAND; wet.		26-27.5	94	6/6	
-27			CL: Light gray (10 YR 7/2) CLAY; little silt; trace black organics.				5/6 6/6	
-28			SW: Yellowish brown fine SAND. Wet.		27.5-29	83	8/6 4/6	
-29			CL: Light gray CLAY; some fine sand; little organics.				6/6	
-30			SW: Dark gray fine SAND (10 YR 4/1).		29-30.5	89	7/6 7/6 8/6	
-31			SP: Yellowish brown to dark grayish brown (10 YR 4/2) fine SAND; trace clay at depth, trace organics.					
-32			SW: Light brownish gray (10 YR 6/2) to yellowish brown medium to coarse SAND; trace clay.		30.5-32	89	13/6 4/6 10/6	
-33			SP: Light gray (10 YR 7/2) fine to medium SAND; trace silt and clay grading to yellowish brown medium SAND.		32-33.5	89	10/6 6/6 6/6	
-34			SP: Pale brown (10 YR 6/3) to very dark grayish brown (10 YR 3/2) to yellowish brown fine to medium SAND; trace clay and silt.		33.5-35	55	12/6 5/6 7/6	
-35			SP: Yellowish brown fine SAND; little clay.		35-36.5	83	9/6 6/6 9/6	
-36			CL: Yellowish brown to brown CLAY; trace sand.					
-37			GP: Brownish yellow (10 YR 6/6) medium to coarse GRAVEL.		36.5-38	83	13/6 7/6 3/6	
-38			GP: Fine to coarse yellowish brown GRAVEL; some coarse sand, trace clay.					
-39			GC: Brownish yellow to yellow (10 YR 6/6, 7/6) medium GRAVEL; little clay; to CLAY and SAND; to medium GRAVEL; some medium sand, trace clay.		38-39.5	67	2/6 3/6 5/6	
-40			GC: Brown CLAY and medium SAND/fine GRAVEL; soft.		39.5-41	67	6/6 4/6 7/6	
-41			GP: Brownish yellow medium GRAVEL; little clay.					
-42			GP: Brownish yellow/yellow (10 YR 6/6, 7/6) medium SAND and fine GRAVEL; little brown clay.		41-42.5	50	8/6 5/6 4/6	
-43			CL: Brown CLAY; little fine sand to brown CLAY, some yellowish brown medium sand, little fine gravel.		42.5-44	78	3/6 5/6 9/6	
-44			SC: Yellow medium to coarse SAND and CLAY; some medium gravel.		44-45.5	61	7/6 20/6 20/6	
-45								
-46			SC: Yellow medium SAND; some medium gravel; some clay.		45.5-47	75	4/6 9/6 22/6	
-47								
-48			CL: Light gray (10 YR 7/1) to yellowish brown (10 YR 5/4) CLAY; very stiff; some fine gravel; little fine sand; trace silt.		47-48.5	100	50/6 50/6 50/6	
-49			NS: DRILLED THROUGH ROCK				50/5	
-50								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-7

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-51			GC: Very pale brown (10 YR 7/4) CLAY and medium GRAVEL; some medium sand.		50-51.5	94	34/6 50/6	
-52			CL-SC: Limestone to very pale brown CLAY; some medium sand.		51.5-52	100	50/5 50/5	
-53			GC: Very pale brown (10 YR 7/3) CLAY and fine subangular GRAVEL; some medium to coarse sand; very tight.		53-54.4	100	20/6 25/6	
-54			CL: Very pale brown CLAY; some medium to coarse sand, some fine gravel.		54.5-55	100	50/4 50/5	
-55					56-57.5	28	30/6 60/6	
-56					57.5-58.1	100	32/6 27/6 60/2	
-57					59-59.5	50	100/5	
-58			LIMESTONE: Weathered Limestone					
-59			GC: Coarse GRAVEL; some very pale brown medium sand, trace clay.		60.5-61.5	67	23/6 70/6	
-60					62-63.5	44	29/6 17/6	
-61			GC: Very pale brown medium SAND to pale brown/brownish yellow medium GRAVEL; some clay.		63.5-65	55	13/6 20/6 24/6	
-62					65-66.5	67	42/6 28/6 25/6	
-63			SP: Very pale brown (10 YR 7/3) fine to medium SAND; trace silt and clay.		66.5-68	89	14/6 4/6 22/6	
-64			GC: Brownish yellow (10 YR 6/6) CLAY and GRAVEL; trace silt and sand. Very stiff.		68-69.5	0	29/6 10/6 11/6	
-65			CL: Very pale brown CLAY; some silt; little fine sand; trace medium gravel. Stiff.				50/1 70/3	
-66			NS: No Recovery		70-70.25	100		
-67			GP: Very pale brown (10 YR 7/3) medium angular GRAVEL and medium SAND; little clay.		71-71.8	90	39/6 50/4	
-68			GP: Yellow (10 YR 7/6) medium to coarse SAND and medium angular GRAVEL; trace silt.		72.5-72.7	100	50/2	
-69			GC: Very pale brown medium SAND and medium GRAVEL; some clay, trace silt.		74-74.2	100	50/2	
-70			CL-ML: Brownish yellow (10 YR 6/6) CLAY; some silt; trace sand and gravel to very pale brown SILT.		75.5-75.75	100	100/3	
-71			ML: Light gray (10 YR 7/1) SILT; some clay. Very stiff, very dry.		77-77.5	100	100/5	
-72			ML: Light greenish gray (Gley 2 7/1) SILT; some clay, very stiff, very dry.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-7

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-78			ML: Greenish gray (Gley 2 6/1) to very dark bluish green (Gley 2 3/1) SILT; some clay, very dry, very stiff; some sand at depth.		78.5-79.9	100	20/6 30/6	
-80			GP: Light greenish gray (Gley 2 7/1) coarse SAND and medium to coarse GRAVEL; little silt, trace clay. Wet.		80-80.5	100	60/4 60/5	
-81			ML: Greenish gray (Gley 2 6/1) SILT; some clay, little fine gravel.		81.5-82	100	60/5	
-82			ML: Greenish gray (Gley 2 5/1) SILT; some clay, little fine gravel.		83-83.5	100	100/6	
-83			GP: Greenish gray coarse GRAVEL; some coarse sand and clay.		84.5-84.9	100	100/4	
-84			ML: Greenish gray SILT; little clay, little coarse sand, trace medium angular gravel.		86-86.4	100	100/4	
-85			ML: Greenish gray SILT; some medium to coarse sand/fine gravel; little clay.		87.5-87.9	100	100/4	
-86			ML: Greenish gray SILT; some clay, trace coarse gravel.		89-89.5	100	100/5	
-87			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-07A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/1/2006

Date Completed: 11/1/2006

Depth of Hole (ft): 36.00

Boring/Well: MONITORING WELL

Elevation (ft): 9.17

Northing (m): 868789.89 Easting (m): 761817.53 UTM NAD83

Depth to Water (ft): 4.56

Conditions: Asphalt between light poles 064/065

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27			CL: Strong brown (7.5 YR 5/6) CLAY; trace black mottles, trace silt. Stiff.		26-30	62.5	
-28			CL: Strong brown with black mottles CLAY; little fine to medium sand. Slightly moist. Stiff.				
-29			SW: Strong brown fine SAND; trace silt/clay. Moist.				
-30			CL: Strong brown CLAY; little black striations, some fine sand; trace silt. Stiff.				
-31							
-32			CL: Brownish yellow (10 YR 6/6) CLAY; trace silt, trace light blue clay.		32-36	67	
-33			CL: Brownish yellow CLAY; intervals of black fine SAND; moist.				
-34			CL: Brownish yellow CLAY; little fine sand, trace carbonate; trace light blue clay, trace silt.				
-35							
-36							
-37			END OF SAMPLING				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-07B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/30/2006

Date Completed: 10/31/2006

Depth of Hole (ft): 73.00

Boring/Well: MONITORING WELL

Elevation (ft): 9.24

Northing (m): 868796.37

Easting (m): 761825.39

UTM NAD83

Depth to Water (ft): 4.59

Conditions: Asphalt between light poles 063/064

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31							
-32							
-33							
-34							
-35							
-36							
-37							
-38							
-39							
-40							
-41							
-42							
-43							
-44							
-45							
-46							
-47							
48							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-07B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-48							
-49							
-50							
-51							
-52							
-53							
-54							
-55							
-56							
-57							
-58							
-59							
-60							
-61							
-62							
-63							
-64			SP: Very pale brown (10 YR 7/3) fine to medium SAND; wet.		63-66	100	
-65			GP: Very pale brown (10 YR 8/3) coarse GRAVEL; some coarse sand, little silt. Very moist. (carbonate).				
-66			GM: Yellowish brown (10 YR 5/8) SILT; some fine-medium gravel, little clay, stiff. Slightly moist.				
-67							
-68							
-69							
-70			ML: Brownish yellow (10 YR 6/6) SILT; mottled with light bluish gray (Gley 2 7/1) silt; little clay; trace sand. Slightly moist, stiff.		69-69.67	100	
-71			SM: Very pale brown fine to medium SAND and SILT; little fine gravel. Moist.				
-72							
-73							
-74							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-02

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/6/2006

Date Completed: 12/7/2006

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 61.05

Northing (m): 866516.94

Easting (m): 760773.70

UTM NAD83

Gauged Depth to Water (ft): 19.55

Conditions:

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	41.7	SB-03-06-02-4-8
-1			GP: Pale red (10R 7/3) coarse GRAVEL; moist.				
-2			CL: Red (10R 4/6) and bluish gray (Gley 2 6/6) CLAY; high plasticity; little silt; dry.				
-3							
-4			CL: Red and bluish gray CLAY; highly plastic, trace silt and fine sand.		4-8	62.5	
-5							
-6							
-7							
-8			CL: Red/bluish gray CLAY; little silt; some plasticity. Dry.		8-12	100	
-9			CL: Yellowish brown/red/bluish gray CLAY and SILT; dry.				
-10			CL: Yellowish brown (10 YR 5/8), some light gray (10 YR 7/2) CLAY and SILT; little black organics; trace fine sand, dry.				BEGIN CARBONATE ZONE
-11							
-12			SM: Very pale brown (10 YR 7/4) to brownish yellow/light gray fine SAND and SILT; more sandy at depth. Mostly dry.		12-16	91.7	
-13							
-14			ML: Brownish yellow/black SILT; trace fine sand and clay.				
-15							
-16			ML: Grayish brown (10 YR 5/2), yellowish brown, black SILT and CLAY; low plasticity, dry.		16-19	100	BEGIN CARBONATE ZONE
-17			GM: Very pale brown (10 YR 7/4, 7/3) SILT; fine medium GRAVEL, and coarse SAND; dry.				
-18							
-19							
-20							
-21			GM: Very pale brown (little yellowish brown, light gray) medium GRAVEL, coarse SAND, and SILT; slightly moist to very moist.		20-22	100	
-22							
-23							
24							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-02

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-24			GM: Very pale brown (10 YR 8/2, 7/3) SILT and medium to coarse GRAVEL; dry.		24-24.9	100	END CARBONATE ZONE
-25							
-26			GM: Very pale brown fine to medium GRAVEL and SILT; slightly moist at depth.		26-27.67	100	SB-03-06-02-26-28
-27							
-28			SM: Light gray fine SAND; some silt, moist.				
-29			SM: Brownish yellow (10 YR 6/6) fine SAND and SILT; slightly moist.		28-31.67	100	
-30			OL: Brown (10 YR 5/3) to dark bluish gray (Gley 2 4/1) SILT; high amount of shells in bluish gray material; little fine gravel; trace clay. Dry.				
-31							
-32			OL: Dark bluish gray SILT; carbonate fragments. Dry.		32-33.67	100	CARBONATES
-33			GM: Greenish gray (Gley 2 6/1) and very pale brown fine to medium GRAVEL and SILT (carbonates); moist.				
-34							
-35			SP: Very pale brown fine to medium SAND; some fine to medium gravel, little silt near bottom of interval. Wet.		35-37	100	
-36							
-37							
-38			SP: Very pale brown/reddish brown fine SAND; little medium gravel, trace silt. Wet.		38-39.67	100	
-39			SM: Light greenish gray fine SAND and SILT; moist.				
-40			ML: Dark bluish gray SILT; trace clay; stiff, mostly dry.				
-41							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-03A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/27/2006

Date Completed: 10/27/2006

Depth of Hole (ft): 33.00

Boring/Well: MONITORING WELL

Elevation (ft): 36.49

Northing (m): 867224.75 Easting (m): 761011.49 UTM NAD83

Gauged Depth to Water (ft): 26.80

Conditions: Asphalt between light poles 054/055

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24			SM: Very pale brown (10 YR 7/3) fine SAND; little silt. Moist.		24-28	21	
-25			ML: Brownish yellow (10 YR 6/6) SILT; little clay. Low stiffness, moist.				
-26							
-27							
-28							
-29							
-30			GM: Very pale brown to light gray (10 YR 7/2) fine to medium GRAVEL; some coarse sand and silt, trace clay. Calcium carbonates. Wet to moist, very stiff at bottom.		29-33	100	
-31							
-32							
-33							
-34							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-03B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/25/2006

Date Completed: 10/26/2006

Depth of Hole (ft): 55.00

Boring/Well: MONITORING WELL

Elevation (ft): 36.22

Northing (m): 867219.90 Easting (m): 760997.56 UTM NAD83

Gauged Depth to Water (ft): 14.65

Conditions: Asphalt between light poles 053/054

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31							
-32							
-33							
-34							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-03B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-35							
-36							
-37							
-38							
-39							
-40							
-41							
-42							
-43							
-44							
-45							
-46	☒	☒	GM: Greenish gray (Gley 2 5/1) medium GRAVEL; some coarse sand and silt; white carbonates. Moist.		45-45.67	100	
-47	☒	☒					
-48	☒	☒	GP: Light greenish gray (Gley 2 7/1) medium to coarse GRAVEL and coarse SAND; trace/little silt. Wet.		47-48.33	100	
-49	☒	☒	SM: Greenish gray fine SAND; some silt. Very moist.				
-50	☒	☒	GM: Light greenish gray medium to coarse GRAVEL; some sand and silt.		49-49.5	100	
-51	☒	☒	GW: Light greenish gray coarse GRAVEL; wet.				
-52	☒	☒	ML: Dark greenish gray (Gley 2 4/1) SILT; some coarse sand and fine gravel; calcium carbonates. Moist.		51-52	100	
-53	☒	☒	GM: Greenish gray fine to medium GRAVEL; some silt; trace medium sand. Moist.				
-54	☒	☒	GM: Greenish gray medium SAND and fine GRAVEL; some silt; calcium carbonates. Moist.		53-54	50	
-55	☒	☒	GM: Greenish gray SILT; some fine to medium gravel, little medium sand. Stiff, moist.				
-56							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-04A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/30/2006

Date Completed: 11/30/2006

Depth of Hole (ft): 41.00

Boring/Well: MONITORING WELL

Elevation (ft): 42.00

Northing (m): 867307.44

Easting (m): 761301.34

UTM NAD83

Gauged Depth to Water (ft): 32.14

Conditions:

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31							
-32			SM: Light greenish gray (Gley 1 7/1), light gray (10 YR 7/2) and brownish yellow (10 YR 6/8) very fine SAND and SILT; slightly moist.		31-34	100	
-33							
-34			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/6) SILT; little clay; little white gravel, more at depth. Very stiff. Mostly dry.				
-35					35-38.5	88	
-36			GM: Pale brown (10 YR 6/3) to very pale brown (10 YR 8/2) medium to coarse GRAVEL, SILT, and medium SAND; trace clay, moist to wet.				
-37							
-38			GP: Brownish yellow (10 YR 6/6) coarse GRAVEL; little medium sand. Wet.				
-39					39-41	92	
-40			GP: Very pale brown (10 YR 7/4) to yellow (10 YR 7/6) coarse SAND and medium GRAVEL; little silty clay. Wet.				
-41							
-42			GM: Pale brown fine to medium GRAVEL and SILT; little coarse sand, trace clay. Fairly stiff, moist.				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-04B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/13/2006

Date Completed: 11/30/2006

Depth of Hole (ft): 69.00

Boring/Well: MONITORING WELL

Elevation (ft): 41.88

Northing (m): 867304.94

Easting (m): 761290.88

UTM NAD83

Gauged Depth to Water (ft): 18.71

Conditions: Asphalt between light poles 054/055

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	60	
-1			CL: Dark yellowish brown (10 YR 4/4) with reddish blue mottled CLAY; trace fine gravel.				
-2							
-3							
-4			CL: Dark yellowish brown CLAY with red, blue, and green striations/mottles; trace wood fragments and silt. Strong gasoline odor, especially in greenish-blue silty material.	35	4-8	62.5	SB-03-06-04-4-8
-5				157			
-6				150			
-7				200			
-8			CL: Dark yellowish brown/greenish gray (Gley 2 6/1) CLAY; mottled with reds, dark browns; trace reddish silt; trace fine gravel.	97	8-12	88	
-9				5			
-10							
-11							
-12			CH: Dark yellowish brown mottled CLAY; highly plastic, with reds, blues, greenish-grays; trace fine gravel.		12-16	83	
-13							
-14			SC-SM: Yellowish red (5 YR 4/6), brownish yellow (10 YR 6/6), and white CLAY and SAND; more sand at depth; little silt. Stiff, cement-like.				
-15							
-16			CL: Yellowish red to strong brown (7.5 YR 5/6) CLAY; some silt; trace fine white sand. Very stiff, low plasticity, dry.		16-20	96	
-17							
-18							
-19							
-20			ML: Yellowish red (5 YR 4/6) SILT; some clay, trace fine sand. Stiff.		20-24	100	
-21							
-22			CL: Yellowish brown (10 YR 5/8) and white CLAY with some yellowish red silt; stiff, medium plasticity.				
-23							
24							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-04B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-24			ML: Yellowish brown/yellowish red (5 YR 5/8) SILT and CLAY; very stiff, trace fine sand.		24-28	100	
-25							
-26			ML: Yellowish red SILT; some fine sand; some yellowish brown silt and sand.				
-27			CL: Yellowish brown CLAY; some yellowish red clay; trace black organics (silt); stiff, medium plasticity.				
-28			CL: Yellowish brown (10 YR 5/8) CLAY; some silt; little fine white sand; little black silty clay. Stiff.		28-32	100	
-29							
-30			ML: Very pale brown/yellowish brown SILT; some clay, little fine gravel.				
-31			SP: Light gray (10 YR 7/2) fine SAND; some yellowish brown sand, trace silt. Slightly moist.				
-32			SM: Light gray, some yellowish brown fine SAND and SILT.		32-35.5	100	SB-03-06-04-32-36
-33			ML: Light gray/yellowish brown SILT; little clay, trace fine white gravel.				
-34							
-35			GM: Light gray/white SILT and GRAVEL; slightly moist.				
-36			GM: Very pale brown (10 YR 7/3, 7/4) medium GRAVEL and coarse SAND; little silt; trace clay increasing to some silt/clay at depth. Very moist/wet.		36-37.67	100	
-37							
-38							
-39							
-40			GM: Very pale brown (10 YR 7/3) medium GRAVEL; some silt, little coarse sand. Very moist.		40-43	100	
-41			ML: Very pale brown/yellowish brown to greenish gray (Gley 1 6/1) SILT; little fine gravel; trace clay. Very stiff, slightly moist.				
-42							
-43							
-44			ML: Pale green/grayish green (Gley 1 6/2, 5/2) SILT; trace clay; stiff. Dry.		44-46.5	100	
-45							
-46			ML: Pale green/grayish green SILT; little fine gravel. Dry.				
-47							
-48			GM: Very pale brown (10 YR 8/2) medium GRAVEL; some coarse sand; little silt. Wet.		48-48.75	100	
-49							
-50			GM: Light brownish gray (10 YR 6/2) fine GRAVEL and medium SAND; little silt. Wet.		50-50.5	100	
-51							
-52			OL: Greenish gray (Gley 2 5/1) SILT; some shells, trace clay; stiff, dry.		52-53.6	100	
-53							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-04B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-54			GM: Coarse greenish gray GRAVEL; some silt. Very moist.		54-54.5	100	
-55			OL: Greenish gray SILT; trace white shells and clay. Slightly moist.				
-56			GM: Light greenish gray fine to medium GRAVEL; some coarse sand; little silt; very moist.		56-56.8	100	
-57			ML: Bluish gray (Gley 2 5/1) SILT; some fine sand, very moist.				
-58			SM: Dark greenish gray (Gley 2 4/1) fine SAND; little silt. Wet.		58.8	100	
-59			GP: Dark greenish gray medium GRAVEL; little fine sand, trace silt. Wet.				
-60			GM: Dark greenish gray (Gley 2 4/1) fine to medium GRAVEL and SILT; little fine sand; moist.		60-60.5	100	
-61			GM: Bluish gray (Gley 2 6/1) fine to medium GRAVEL; some silt, little fine sand. Slightly moist.				
-62			GM: Greenish gray (Gley 2 5/1) fine GRAVEL, medium SAND, and SILT. Moist.		62-62.8	100	
-63							
-64			GP: Light greenish gray (Gley 2 7/1) coarse GRAVEL; trace coarse sand and silt. Slightly moist.		64-64.5	100	
-65							
-66			ML: Light greenish gray SILT; some fine gravel, little coarse sand, slightly moist.		66-66.67	100	
-67							
-68			ML: Light greenish gray SILT; some medium to coarse gravel, trace medium sand, clay. Slightly moist.		68-68.67	100	
-69							
-70							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-05A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/10/2006

Date Completed: 11/10/2006

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 38.10

Northing (m): 867702.22

Easting (m): 761461.54

UTM NAD83

Gauged Depth to Water (ft): 32.47

Conditions: Asphalt between light poles 057/058

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31	☒	☒	GM: Light gray (10 YR 7/2) and very pale brown (10 YR 7/4) medium GRAVEL; some medium to coarse sand; some silt, little clay. Dry.		30-32.2	100	
-32	☒	☒					
-33	☒	☒					
-34	☒	☒					
-35	☒	☒	GP: Very pale brown medium GRAVEL; some coarse sand; little silt, little yellowish brown (10 YR 5/8) silt; trace clay. Wet.		34-38	54	
-36	☒	☒					
-37	☒	☒					
-38	☒	☒					
-39	☒	☒	GP: Very pale brown, yellowish brown medium to coarse angular GRAVEL; some coarse sand; little silt. Wet.		38-40	50	
-40	☒	☒					
-41			END OF SAMPLING				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-05B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/7/2006

Date Completed: 11/9/2006

Depth of Hole (ft): 70.00

Boring/Well: MONITORING WELL

Elevation (ft): 37.85

Northing (m): 867716.60

Easting (m): 761458.35

UTM NAD83

Gauged Depth to Water (ft): 23.35

Conditions: Asphalt between light poles 57/58

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	54	
-1			CL-ML: Dark yellowish brown (10 YR 4/4) CLAY and SILT, stiff; trace gravel. Slightly moist				
-2			ML: Yellowish brown (10 YR 5/8) SILT; little clay, little reddish silt.				
-3							
-4			ML: Strong brown (7.5 YR 5/8) mottled with reddish brown (5 YR 4/4), pinkish gray (5 YR 7/1) SILT; some clay; very stiff, dry.		4-8	89.6	SB-03-06-05-4-8 06-NO-08-DP
-5							
-6							
-7							
-8			ML: Alternating, some mottling, of reddish brown, yellowish brown, and white (10 YR 8/1) SILT; some clay (mostly white-colored material). Very stiff, dry.		8-12	83	
-9							
-10							
-11							
-12			CL-ML: Strong brown SILT and CLAY to white CLAY to reddish brown SILT; very stiff, dry.		12-16	100	
-13			OL: Yellowish brown SILT and CLAY; little black organics, trace gravel. Very stiff, dry.				
-14			CL-ML: White CLAY with interbedded reddish brown SILT; very stiff, dry.				
-15							
-16			CL: Mottled/striated yellowish brown/reddish brown/white CLAY; little silt. Stiff, dry.		16-20	100	
-17			OL: Yellowish brown SILT and CLAY; little black remnant organics; trace fine sand, stiff, dry.				
-18							
-19			OL: Yellowish brown SILT; some clay; little fine sand; trace black remnant organics. Dry.				
-20			OL: Brownish yellow (10 YR 6/8) SILT; some clay, trace black remnant organics.		20-24	100	
-21			OL: Dark yellowish brown (10 YR 4/4) to brownish yellow SILT; little clay, little black silt. Stiff, dry.				
-22			GM: Light gray (10 YR 7/2) to very pale brown (10 YR 7/3) SILT and fine to medium GRAVEL; little fine medium sand				

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-05B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-23			SILT and fine to medium GRAVEL; little fine medium sand (carbonate sands/gravel.)				BEGIN CARBONATE ZONE
-24			GM: Light gray to very pale brown fine to medium GRAVEL and SILT; very brittle; little medium sand, trace clay. Dry. (Carbonates)		24-28	89.6	
-25							
-26							SB-03-06-05-28-32
-27							
-28			GM: Light gray/very pale brown fine to medium GRAVEL; some silt, some medium sand, trace clay. Dry. (carbonates)		28-32	100	
-29							
-30			GM: Very pale brown medium GRAVEL; some silt, some medium sand, little clay. Slightly moist (carbonates)				
-31							
-32			SP: Very pale brown/light gray medium to coarse SAND; some coarse gravel, little clay, trace silt. Very moist, wet. (carbonates)		32-36	50	
-33							
-34							
-35							END CARBONATE ZONE
-36			GP: Very pale brown medium GRAVEL; some medium to coarse sand, little silt, wet. (Carbonates)		36-40	75	
-37							
-38			GM: Yellowish brown SILT and coarse GRAVEL; some clay; moist.				
-39							
-40			GM: Brownish yellow (10 YR 6/6) medium to coarse GRAVEL and SILT; little clay. Very moist.		40-44	50	
-41							
-42							
-43							
-44			CL: Dark yellowish brown (10 YR 4/6) CLAY, some silt, moist.		44-47	100	
-45			CL-ML: Light gray (10 YR 7/2) and very pale brown (10 YR 7/3) CLAY and SILT; little fine gravel. Slightly moist, stiff.				
-46							
-47							
-48			ML: Very pale brown SILT; some fine to medium gravel and clay; slightly moist, stiff.		48-51	61	
-49			SM: Brownish yellow/very pale brown fine SAND and SILT;				

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-05B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-50			trace clay, slightly moist. Dense.				
-51							
-52			SW: Greenish gray (Gley 1 6/1) and some brownish yellow fine SAND; little silt, trace clay. Slightly moist.		52-55.67	100	
-53			CL-ML: Brownish yellow/greenish gray CLAY and SILT; little fine sand, trace purplish clay.				
-54			SM: Greenish gray/brownish yellow fine SAND and SILT. Moist.				
-55			CL: Brownish yellow CLAY. Moist.				
-56			GM: Medium to coarse very pale brown GRAVEL; some medium sand, little silt. Wet. (carbonates)		56-58.5	100	CARBONATE ZONE
-57			GM: Greenish gray (Gley 1 6/1) and very pale brown SILT, CLAY, and fine GRAVEL. Very stiff. Dry (carbonate).				
-58							
-59							
-60			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; little clay, little fine sand. Slightly moist, fairly stiff.		60-62	100	
-61							
-62			ML: Greenish gray SILT; little fine sand, trace iron oxides.		62-64	100	
-63			SW: Light yellowish brown (10 YR 6/4) fine SAND; wet.				
-64			SM: Greenish gray SILT and yellowish brown fine SAND; very moist.		64-65.67	90	
-65			SW: Greenish gray/light yellowish brown fine SAND; little silt. Very moist.				
-66			ML: Yellowish brown SILT; little clay and fine sand. Moist.		66-66.5	100	
-67							
-68			OL: Very dark gray (10 YR 3/1) SILT; little fine sand, trace clay; trace shells. Stiff.		68-69.67	100	
-69							
-70							
-71							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-06A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/6/2006

Date Completed: 11/7/2006

Depth of Hole (ft): 20.00

Boring/Well: MONITORING WELL

Elevation (ft): 13.53

Northing (m): 868268.25

Easting (m): 761468.57

UTM NAD83

Gauged Depth to Water (ft): 3.60

Conditions: Asphalt between light poles 060/061

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9			ML: Strong brown (7.5 YR 5/6) SILT; little reddish silt; trace black gravel, trace clay, trace fine sand.		8-12	83	
-10			ML: Strong brown/dark reddish brown (5 YR 3/4) SILT; some yellowish brown; trace white clay. Stiff material, fairly dry.				
-11							
-12							
-13			CL-ML: Yellowish/reddish SILT and white CLAY; lenses of medium sand, fine gravel at lower end of sample; some black organics; wet at depth.		12-16	100	
-14							
-15							
-16			CL: Strong brown CLAY; little reddish silt; little fine black gravel at bottom.		16-20	100	
-17			CL: Light greenish gray (Gley 2 7/1) CLAY; little reddish mottles of silt; trace fine gravel.				
-18							
-19							
-20			CL-ML: Yellowish brown (10 YR 5/6) CLAY and SILT; little light greenish gray clay.				
-21			END OF SAMPLING				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-06B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment:

Drill Type: HSA

Date Started: 11/2/2006

Date Completed: 11/3/2006

Depth of Hole (ft): 67.00

Boring/Well: MONITORING WELL

Elevation (ft): 13.25

Northing (m): 868277.70 Easting (m): 761473.77 UTM NAD83

Gauged Depth to Water (ft): 8.23

Conditions:

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	44	SB-03-06-06-4-8
-1			GP: Dark bluish gray fine to coarse GRAVEL; some coarse sand, little silt. Dry.				
-2			CL: Dark yellowish brown (10 YR 4/4 CLAY; some mixed gravel, brick (fill). Dry.				
-4			CL: Dark yellowish brown CLAY; little dark blue gravel; trace sand. Stiff. Dry.		4-8	42	
-5			CL-ML: Dark greenish gray (Gley 2 4/1) CLAY and SILT; little yellowish brown sand, moist. Some organics				
-6			ML: Yellowish brown (10 YR 5/8) SILT, some clay; trace fine sand. Dry.				
-8			NS: NO RECOVERY, HIGH AMOUNT OF WATER IN HOLE		8-12	0	
-12			CL-ML: Alternating layers of yellowish brown/reddish brown (5 YR 4/4) SILT with white CLAY; fairly regular intervals; more silty than clay. Trace gravel. Stiff, dry.		12-16	94	
-16			CL-ML: Striated yellowish brown SILT; some red silt, little white clay, trace black silt (old organic matter).		16-20	100	
-20			GW: Coarse light gray/brown GRAVEL.		20-24	31	

Note: Unless otherwise noted VOC reading = 0.



Log of Boring: **MW-06B**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-21			SM: Yellowish brown (10 YR 5/6) and black fine to medium SAND and SILT. Moist.				
-22			OL: Yellowish brown/black SILT; little fine sand.				
-23			CL-ML: Yellowish brown/reddish brown (5 YR 4/4) SILT; some white clay, trace fine sand.				
-24			NS: NO RECOVERY. SPOON COLLECTED REMAINING CLAY FROM PREVIOUS SAMPLE. COARSE GRAVEL FRAGMENT AT BOTTOM OF SPOON.		24-28	0	
-25							
-26							
-27							
-28			CL-ML: Brownish yellow (10 YR 6/6) CLAY and SILT mottled with reds, blacks, and whites (blacks likely remnant organics). Very stiff.		28-32	100	
-29							
-30							
-31							BEGIN CARBONATE ZONE
-32			ML: Yellow (10 YR 7/6) SILT, grading to very pale brown SILT, trace fine gravel (carbonates).		32-36	100	SB-03-06-06-32-36
-33			CL-ML: Very pale brown (10 YR 7/3, 8/2) little black SILT and CLAY; trace fine gravel.				
-34			GM: Very pale brown fine to coarse GRAVEL and SILT; little clay, trace medium sand (carbonates). Moist.				
-35							
-36			GM: Very pale brown fine to medium GRAVEL and SILT; trace clay, trace medium sand. Moist.		36-40	67	
-37							
-38			GM: Very pale brown fine to medium GRAVEL; some silt, some medium sand. Very moist (carbonates).				
-39							
-40			GM: Very pale brown fine to medium GRAVEL and SILT; little coarse sand, trace clay.		40-44	71	
-41			OL: Yellowish brown (10 YR 5/6) SILT; some black silt (organics); little clay.				
-42			GP: Very pale brown medium to coarse GRAVEL; some coarse sand, trace silt.				
-43			OL: Yellowish brown SILT; some black silt, little clay.				
-44			GP: Yellowish brown coarse GRAVEL; little silt.				
-45			GM: Yellowish brown to very pale brown fine to coarse GRAVEL and SILT; trace sand and clay, more sand at bottom of spoon. Moist (carbonates).		44-45.7	100	



Log of Boring: **MW-06B**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-46							
-47							
-48			GM: Very pale brown fine to medium GRAVEL; some silt, trace clay and sand.		48-52	62.5	
-49			GP: Yellowish brown medium angular GRAVEL; little coarse sand, wet.				
-50			ML: Very pale brown SILT; some fine to medium sand, trace fine gravel. Moist.				
-51							
-52			GM: Yellowish brown to very pale brown GRAVEL and SILT; very moist.		52-52.67	100	
-53			ML: Very pale brown SILT; stiff, dry.				
-54			ML: Light gray (10 YR 7/2) to very pale brown SILT; little fine gravel. Stiff.		54-55.5	100	
-55							
-56			ML: Light gray SILT; stiff; little/trace medium sand.		56-58	100	
-57							
-58			ML: Yellowish brown/light gray SILT; trace clay, stiff.				
-59			GM: Light gray SILT and fine GRAVEL/coarse SAND. Moist.		58-58.85	100	
-60							
-61			GM: Very pale brown (10 YR 7/3) and light gray (10 YR 7/2) medium GRAVEL; some coarse sand and silt. Moist. (Carbonates)		60-60.67	100	
-62			ML: Light gray SILT; some fine gravel; some coarse sand, trace clay. Moist.		62-62.85	100	
-63							
-64			ML: Light gray SILT; some medium gravel.		64-64.85	100	
-65			GM: Light greenish gray (Gley 2 7/1) to greenish gray (Gley 2 6/1) SILT and fine GRAVEL; grading to SILT; little gravel. Moist to dry.				
-66			ML: Greenish gray SILT; some fine to medium gravel/coarse sand. Dry.		66-67	100	
-67			END OF SAMPLING				
-68							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-07A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 11/1/2006

Date Completed: 11/1/2006

Depth of Hole (ft): 36.00

Boring/Well: MONITORING WELL

Elevation (ft): 9.17

Northing (m): 868789.89 Easting (m): 761817.53 UTM NAD83

Gauged Depth to Water (ft): 4.56

Conditions: Asphalt between light poles 064/065

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27			CL: Strong brown (7.5 YR 5/6) CLAY; trace black mottles, trace silt. Stiff.		26-30	62.5	
-28			CL: Strong brown with black mottles CLAY; little fine to medium sand. Slightly moist. Stiff.				
-29			SW: Strong brown fine SAND; trace silt/clay. Moist.				
-30			CL: Strong brown CLAY; little black striations, some fine sand; trace silt. Stiff.				
-31							
-32			CL: Brownish yellow (10 YR 6/6) CLAY; trace silt, trace light blue clay.		32-36	67	
-33			CL: Brownish yellow CLAY; intervals of black fine SAND; moist.				
-34			CL: Brownish yellow CLAY; little fine sand, trace carbonate; trace light blue clay, trace silt.				
-35							
-36							
-37			END OF SAMPLING				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-07B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/30/2006

Date Completed: 10/31/2006

Depth of Hole (ft): 73.00

Boring/Well: MONITORING WELL

Elevation (ft): 9.24

Northing (m): 868796.37

Easting (m): 761825.39

UTM NAD83

Gauged Depth to Water (ft): 4.59

Conditions: Asphalt between light poles 063/064

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21							
-22							
-23							
-24							
-25							
-26							
-27							
-28							
-29							
-30							
-31							
-32							
-33							
-34							
-35							
-36							
-37							
-38							
-39							
-40							
-41							
-42							
-43							
-44							
-45							
-46							
-47							
48							

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-07B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-48							
-49							
-50							
-51							
-52							
-53							
-54							
-55							
-56							
-57							
-58							
-59							
-60							
-61							
-62							
-63							
-64			SP: Very pale brown (10 YR 7/3) fine to medium SAND; wet.		63-66	100	
-65			GP: Very pale brown (10 YR 8/3) coarse GRAVEL; some coarse sand, little silt. Very moist. (carbonate).				
-66			GM: Yellowish brown (10 YR 5/8) SILT; some fine-medium gravel, little clay, stiff. Slightly moist.				
-67							
-68							
-69							
-70			ML: Brownish yellow (10 YR 6/6) SILT; mottled with light bluish gray (Gley 2 7/1) silt; little clay; trace sand. Slightly moist, stiff.		69-69.67	100	
-71			SM: Very pale brown fine to medium SAND and SILT; little fine gravel. Moist.				
-72							
-73							
-74							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-08A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/7/2006

Date Completed: 12/7/2006

Depth of Hole (ft): 28.00

Boring/Well: MONITORING WELL

Elevation (ft): 19.92

Northing (m): 868068.71

Easting (m): 762036.57

UTM NAD83

Gauged Depth to Water (ft): 13.03

Conditions: Asphalt Parking Lot outside DPW

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0							
-1							
-2							
-3							
-4							
-5							
-6							
-7							
-8							
-9							
-10							
-11							
-12							
-13							
-14							
-15							
-16							
-17							
-18							
-19							
-20							
-21			CL: Bluish gray (Gley 2 6/1) CLAY; some white medium GRAVEL; little fine sand. Moderate plasticity.		20-24	67	
-22			CL: Bluish gray and yellowish brown (10 YR 5/8), little red CLAY; intervals (seams) of fine sand; more sand at depth. Very moist, little stiffness.				
-23							
-24			CL: Bluish gray CLAY; little fine sand; moist.		24-48	69	
-25			SP: Dark grayish brown (10 YR 4/2) fine SAND; coarse white gravel at top; wet.				
-26			SM: Bluish gray/yellowish brown fine SAND and SILT; trace clay, very moist.				
-27			SP: Grayish brown (10 YR 5/2) fine SAND; trace silt, wet.				
-28			END OF SAMPLING				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-08B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/4/2006

Date Completed: 12/6/2006

Depth of Hole (ft): 67.00

Boring/Well: MONITORING WELL

Elevation (ft): 19.66

Northing (m): 868073.87

Easting (m): 762044.56

UTM NAD83

Gauged Depth to Water (ft): 15.05

Conditions: Asphalt lot outside DPW area

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
0			FILL: Asphalt		0-4	52	
-1			GP: White, very pale brown (10 YR 8/2) coarse GRAVEL; trace silt. Dry.				
-2			GC: Dark yellowish brown (10 YR 4/4) CLAY and coarse white GRAVEL; dry.				
-3							
-4			CL: Dark yellowish brown CLAY; little fine gravel; little silt. (SAMPLE CATCHER BROKE, LIMITED RECOVERY)		4-8	25	
-5							
-6							
-7							
-8			CL: Dark yellowish brown CLAY.		8-12	8.3	
-9			SC: Greenish gray (Gley 2 5/1) and dark yellowish brown CLAY and fine SAND; slightly moist. (VERY LIMITED RECOVERY; NO CHEMICAL SAMPLE POSSIBLE)				
-10							
-11							
-12			SC: Greenish gray and dark yellowish brown CLAY and fine SAND; slightly moist.		12-16	100	SB-03-06-08-12-16 06-DE-04-DP
-13			OH: Very dark bluish gray (Gley 2 3/1) CLAY; little brown/black organics. Very high plasticity, low stiffness.				
-14							
-15							
-16			OH: Greenish gray and dark yellowish brown CLAY; little fine sand; trace gravel. Moist.		16-20	100	SB-03-06-08-16-20
-17							
-18							
-19			SC: Greenish gray/dark yellowish brown CLAY and fine SAND (more sand at depth). Very moist.				
-20							
			SC: Bluish gray (Gley 2 6/1) and dark yellowish brown fine		20-24	87.5	

Note: Unless otherwise noted VOC reading = 0.



Log of Boring: **MW-08B**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-21			SAND and CLAY; moist.				
-22			SW: Bluish gray fine SAND; dark yellowish brown sand at depth; trace clay. Wet.				
-23			CL: Dark yellowish brown and bluish gray CLAY; some fine sand, trace with fine sand. Moist, fairly stiff.				
-24			CL: Bluish gray CLAY; little fine sand, moist.		24-28	100	
-25							
-26			SC: Bluish gray CLAY and fine SAND; wet.				
-27			SW: Dark yellowish brown fine SAND to gray fine SAND; trace clay, wet.				
-28			CL: Bluish gray/dark yellowish brown CLAY; some fine sand, trace white fine sand. Very moist.				
-29			CL: Bluish gray/yellowish brown (10 YR 5/4, 5/6) CLAY; some fine sand, more sand at depth. Trace reddish fine sand, moist.		28-32	100	
-30			CL-ML: Brownish yellow (10 YR 6/8) CLAY and SILT; some black/brown organics, trace coarse sand/fine gravel. Slightly moist.				
-31							
-32			CL: Brownish yellow, some bluish gray, gray CLAY; some silt, little plasticity.		32-36	100	
-33			CL-ML: Dark yellowish brown CLAY and SILT; some black organics, little medium gravel (white carbonate).				
-34			CL: Brownish yellow/very pale brown (10 YR 7/4) CLAY; some medium white carbonate gravel; trace silt. Very moist				
-35			GC: Brownish yellow medium GRAVEL; little clay, trace silt. Very moist.				BEGIN CARBONATE ZONE
-36			GC: Dark grayish brown (10 YR 4/2) medium to coarse GRAVEL; some coarse sand, some clay. Wet.		36-39.67	47.6	
-37			CL: Yellowish brown CLAY; trace black organics, trace fine sand.				
-38			GP: Very pale brown (10 YR 7/4) medium GRAVEL; some coarse gravel, little clay. Wet.				
-39							
-40			GP: Very pale brown (10 YR 7/3) medium to coarse GRAVEL and coarse SAND; little silt/clay; carbonates; very moist to wet.		40-44	54	
-41							
-42							
-43							
-44			GM: Brown (10 YR 5/3) medium to coarse GRAVEL and coarse SAND; some silt, trace clay. Very wet. (SAMPLE CATCHER BROKE; MAY HAVE LOST SOME SAND).		44-48	33	
-45							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-08B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	Remarks/Sample Name
				VOC (ppm)			
-46							
-47							
-48							
-49			GM: Very pale brown/light gray (10 YR 7/2) medium GRAVEL and SILT; little yellowish brown (10 YR 5/6) silt; little coarse sand. Slightly moist to moist.		48-50.67	87.5	
-50							
-51							
-52			GM: Very pale brown/light greenish gray (Gley 1 7/1) medium GRAVEL and SILT; slightly moist.		52-55.67	100	
-53			SM: Light greenish gray/yellowish brown SILT and fine SAND; slightly moist.				
-54			GM: Medium GRAVEL and SILT (shells).				
-55			ML: Greenish gray (Gley 2 6/1) and yellowish brown SILT; trace fine gravel, stiff.				
-56			GM: Very pale brown coarse GRAVEL and SILT.				
-57							
-58							
-59							
-60			GM: Greenish gray (Gley 1 6/1) SILT and fine to medium GRAVEL; some coarse sand; slightly moist.		60-60.67	100	
-61			ML: Very pale brown SILT; some gravel. Dry.				
-62			GM: Greenish gray/yellowish brown (10 YR 5/8) SILT and fine to medium GRAVEL/coarse sand; stiff, mostly dry.		62-63	100	
-63							
-64			GM: Greenish gray SILT and fine to medium GRAVEL; some coarse sand; slightly moist.		64-65	100	
-65							
-66			GM: Light greenish gray SILT and medium GRAVEL; some coarse sand. Slightly moist.		66-66.5	100	
-67			END OF SAMPLING				
-68							



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-09A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 5/10/2007

Date Completed: 5/11/2007

Depth of Hole (ft): 46.00

Boring/Well: MONITORING WELL

Elevation (ft): 39.12

Northing (m): 867399.53

Easting (m): 761776.50

UTM NAD83

Gauged Depth to Water (ft): 26.22

Conditions: Grass

Comments: Buchanan, south of DPW yard

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			CL-ML: Organics underlain by dark brown (10 YR 3/3) CLAY and SILT; trace gravel. Dry.		0-4	75	8/12	
-1			CL: Yellowish brown (10 YR 5/8) and light gray (10 YR 7/2) CLAY; some silt; soft, dry.				14/12	
-2			GM: Dark yellowish brown (10 YR 3/6) and black fine GRAVEL and SILT, dry.				22/12	
-3			ML: Yellowish brown, little black, trace yellowish red (5 YR 4/6) SILT; trace clay and fine gravel. Dry.				27/12	
-4			ML: Yellowish brown SILT; little fine black gravel; little yellowish red silt. Dry.		4-8	75	20/12	
-5			CL-ML: Yellowish brown SILT; some yellowish red silt interspersed with white clay; dry, stiff.				32/12	
-6			CL-ML: Yellowish red SILT with striations of white CLAY; little yellowish brown silt; very stiff, dry.				47/12	
-7							42/12	
-8			CL: White CLAY; striations of reddish brown (5 YR 5/4) silt and fine gravel, stiff; medium plasticity; dry.		8-12	85	9/12	
-9							14/12	
-10							19/12	
-11							24/12	
-12			CL: White CLAY; some silt. Medium stiffness, dry.		12-16	100	9/12	
-13			SM: White fine SAND underlain by yellowish red fine SAND; some silt, slightly moist.				14/12	
-14			CL-ML: White CLAY; medium stiffness, medium plasticity; some yellowish red silt, dry.				22/12	
-15			ML: Yellowish brown, yellowish red and light gray SILT; little clay, trace fine sand. Stiff, dry.				24/12	
-16			ML: Yellowish brown SILT; little fine sand, trace clay. Dry.		16-20	63	10/12	
-17							16/12	
-18			CL-ML: Yellowish brown SILT and CLAY; some light gray clay, slightly plastic; medium stiffness, dry.				22/12	
-19							23/12	
-20			CL: Brownish yellow, light greenish gray (Gley 2 7/1) CLAY; some silt, little black organics (silt); fairly soft, medium plasticity; slightly moist.		20-24	83	7/12	
-21							12/12	
-22							15/12	
-23							18/12	
24								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-09A

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-24			CL: Brownish yellow, light greenish gray, black CLAY; little silt, medium plasticity, fairly stiff. Slightly moist.		24-28	79	10/12	
-25			GC: Brownish yellow, some very pale brown (10 YR 7/4) fine to coarse GRAVEL and CLAY; little silt, very moist to wet. (START CARBONATE ZONE)				14/12	
-26							16/12	
-27							12/12	
-28			GM: Very pale brown, trace brown (10 YR 4/3) fine to coarse GRAVEL and SILT; little clay; stiff, slightly moist.		28-32	100	14/12	
-29							58/12	
-30							75/12	
-31			CL: Yellow (2.5 Y 7/6) CLAY; little fine gravel, little silt; low plasticity, stiff, mostly dry.				100/12	
-32			ML: Pale yellow (2.5 Y 7/3) SILT; little fine gravel, very stiff, dry.		32-36	100	27/12	
-33			ML: Greenish gray (Gley 2 6/1), yellowish brown SILT; some fine sand, trace clay; dense, dry.				40/12	
-34							48/12	
-35			ML: Greenish gray and yellowish brown SILT; some clay, little fine gravel; stiff, dry.				50/12	
-36			SM: Brownish yellow (10 YR 6/6) SILT; some fine gravel/coarse sand, dense; moist. Evidence of carbonates.		36-37	100	100/12	
-37								
-38			GM: Very pale brown (10 YR 8/2) coarse SAND and fine angular GRAVEL; little silt, wet.		38-40	100	35/12	
-39							100/12	
-40			GM: Very pale brown (10 YR 8/4, 7/4) coarse SAND and fine GRAVEL; some silt, wet.					
-41								
-42			SM: Very pale brown (10 YR 8/2) and light greenish gray (Gley 1 7/1) SILT and coarse SAND; little fine gravel, moist.		42-44.33	100	69/12	
-43			ML: Light greenish gray SILT; trace fine gravel. Slightly moist.				100/16	
-44								
-45			END OF SAMPLING					
-46								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-09B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 5/8/2007

Date Completed: 5/10/2007

Depth of Hole (ft): 68.00

Boring/Well: MONITORING WELL

Elevation (ft): 38.90

Northing (m): 867399.57

Easting (m): 761765.01

UTM NAD83

Gauged Depth to Water (ft): 16.35

Conditions: Grass

Comments: Buchanan, south of DPW complex

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			CL-ML: Organics underlain by dark brown (10 YR 3/3) CLAY and SILT; trace gravel. Dry.		0-4	75	8/12	
-1			CL: Yellowish brown (10 YR 5/8) and light gray (10 YR 7/2) CLAY; some silt; soft, dry.				14/12	
-2			GM: Dark yellowish brown (10 YR 3/6) and black fine GRAVEL and SILT, dry.				22/12	
-3			ML: Yellowish brown, little black, trace yellowish red (5 YR 4/6) SILT; trace clay and fine gravel. Dry.				27/12	
-4			ML: Yellowish brown SILT; little fine black gravel; little yellowish red silt. Dry.		4-8	75	20/12	
-5			CL-ML: Yellowish brown SILT; some yellowish red silt interspersed with white clay; dry, stiff.				32/12	
-6			CL-ML: Yellowish red SILT with striations of white CLAY; little yellowish brown silt; very stiff, dry.				47/12	
-7							42/12	
-8			CL: White CLAY; striations of reddish brown (5 YR 5/4) silt and fine gravel, stiff; medium plasticity; dry.		8-12	85	9/12	
-9							14/12	
-10							19/12	
-11							24/12	
-12			CL: White CLAY; some silt. Medium stiffness, dry.		12-16	100	9/12	
-13			SM: White fine SAND underlain by yellowish red fine SAND; some silt, slightly moist.				14/12	
-14			CL-ML: White CLAY; medium stiffness, medium plasticity; some yellowish red silt, dry.				22/12	
-15			ML: Yellowish brown, yellowish red and light gray SILT; little clay, trace fine sand. Stiff, dry.				24/12	
-16			ML: Yellowish brown SILT; little fine sand, trace clay. Dry.		16-20	63	10/12	
-17							16/12	
-18			CL-ML: Yellowish brown SILT and CLAY; some light gray clay, slightly plastic; medium stiffness, dry.				22/12	
-19							23/12	
-20			CL: Brownish yellow, light greenish gray (Gley 2 7/1) CLAY; some silt, little black organics (silt); fairly soft, medium plasticity; slightly moist.		20-24	83	7/12	
-21							12/12	
-22							15/12	
-23							18/12	
24								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-09B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-24			CL: Brownish yellow, light greenish gray, black CLAY; little silt, medium plasticity, fairly stiff. Slightly moist.		24-28	79	10/12	
-25			GC: Brownish yellow, some very pale brown (10 YR 7/4) fine to coarse GRAVEL and CLAY; little silt, very moist to wet. (START CARBONATE ZONE)				14/12	
-26							16/12	
-27							12/12	
-28			GM: Very pale brown, trace brown (10 YR 4/3) fine to coarse GRAVEL and SILT; little clay; stiff, slightly moist.		28-32	100	14/12	
-29							58/12	
-30							75/12	
-31			CL: Yellow (2.5 Y 7/6) CLAY; little fine gravel, little silt; low plasticity, stiff, mostly dry.				100/12	
-32			ML: Pale yellow (2.5 Y 7/3) SILT; little fine gravel, very stiff, dry.		32-36	100	27/12	
-33			ML: Greenish gray (Gley 2 6/1), yellowish brown SILT; some fine sand, trace clay; dense, dry.				40/12	
-34							48/12	
-35			ML: Greenish gray and yellowish brown SILT; some clay, little fine gravel; stiff, dry.				50/12	
-36			ML: Greenish gray and yellowish brown SILT; some clay, some coarse sand, dry.		36-37	100	100/12	
-37			GP: Very pale brown coarse SAND and fine GRAVEL; little silt, moist.					
-38			GP: Very pale brown coarse SAND and fine GRAVEL; little silt, wet.		38-39	100	100/12	
-39								
-40			GM: Very pale brown (10 YR 7/3) and pale brown (10 YR 6/3) fine GRAVEL, SILT, and coarse SAND; little yellowish brown gravel and silt, dense; slightly moist.		40-42.5	100	84/12	
-41							100/18	
-42								
-43								
-44			GM: Very pale brown (10 YR 8/2, 8/3) SILT and fine GRAVEL; some coarse sand, moist to wet.		44-44.83	100	100/10	
-45								
-46			GM: Very pale brown SILT and fine GRAVEL; some coarse sand, wet.		46-46.83	100	100/10	
-47								
-48			GM: Gray (10 YR 6/1) SILT and fine to medium GRAVEL; dense, slightly moist.		48-49.83	100	68/12	
-49			SM: Light Gray (10 YR 7/2) SILT and fine SAND; some fine gravel, dense, moist.				100/10	
-50			GM: Pale brown SILT, coarse SAND, and fine GRAVEL; dense, slightly moist.		50-50.92	100	100/11	
-51								
-52			ML: Bluish gray, dark bluish gray (Gley 2 5/1, 4/1) SILT with shells, very dense, stiff. Dry.		52-53.83	100	35/12	
-53								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-09B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-54			SM: Bluish gray coarse SAND; some silt with shells, little fine gravel. Moist.		54-54.92	100	100/10	
-55			OL: Bluish gray SILT; little shells and fine sand. Stiff, slightly moist.				100/11	
-56			GW: Bluish gray coarse GRAVEL; little silt, wet.		56-56.67	100	100/8	
-57								
-58			GP: Bluish gray fine SAND and fine GRAVEL; little silt, wet.		58-59.75	100	52/12	
-59							100/9	
-60			SM: Bluish gray SILT and coarse SAND; some fine gravel, moist.		60-61	100	100/12	
-61								
-62			SM: Bluish gray coarse SAND; some silt, little fine to medium gravel, very moist.		62-63	100	100/12	
-63								
-64			SP: Light greenish gray, light bluish gray (Gley 2 7/1) coarse SAND and medium angular GRAVEL; little silt, wet.		64-65	100	100/12	
-65								
-66			ML: Light greenish gray SILT; little fine to coarse sand, trace fine gravel, slightly moist.		66-67	100	100/12	
-67			END OF SAMPLING					
-68								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-10A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/26/2007

Date Completed: 4/26/2007

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 29.48

Northing (m): 867936.54

Easting (m): 761748.49

UTM NAD83

Gauged Depth to Water (ft): 25.29

Conditions: Asphalt

Comments: Buchanan, on north side of DPW complex

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Asphalt		0-4	42	15/12	
-1			SM: Very dark gray (7.5 YR 3/1) to bluish gray (Gley 2 6/1) coarse SAND; some silt, some fine gravel, dry.				18/12	
-2			SP: Black (10 YR 2/1) and yellowish brown (10 YR 5/6) fine SAND; trace medium gravel.				15/12	
-3			CL: Yellowish brown CLAY; dense, medium plasticity; trace fine gravel.				18/12	
-4			CL: Dark yellowish brown (10 YR 3/4) CLAY; medium plasticity, trace fine gravel. Slightly moist.		4-8	33	11/12	
-5			GW: Yellow (10 YR 7/6) coarse, subangular GRAVEL; trace medium sand and trace clay. Wet.				21/12	
-6							32/12	
-7							40/12	
-8			GW: Yellow coarse GRAVEL; little clay, trace fine sand.		8-12	33	16/12	
-9			CL: Brownish yellow (10 YR 6/6) to strong brown (7.5 YR 4/6) CLAY; dense, medium plasticity; little silt, trace medium sand. Dry.				16/12	
-10							25/12	
-11							27/12	
-12			CL-ML: Alternating/mottled coloring: yellowish red (5 YR 4/6), yellowish brown (10 YR 5/6) SILT and white CLAY; medium plasticity, very stiff; trace fine sand, dry.		12-16	100	14/12	
-13							28/12	
-14							41/12	
-15							42/12	
-16			UNKNOWN: NO RECOVERY		16-20	0	17/12	
-17							21/12	
-18							30/12	
-19							39/12	
-20			CL-ML: Yellowish red (5 YR 4/6) SILT and yellowish brown (10 YR 5/6) CLAY; (little wet fine gravel/coarse sand at 6"). Stiff.		20-24	100	17/12	
-21							23/12	
-22			CL: White, very pale brown (10 YR 8/2) and brownish yellow (10 YR 6/6) CLAY; some silt, mottled with reds and blacks (organics); stiff, dry.				28/12	
-23							33/12	
-24			CL: Yellowish brown to brown CLAY; some silt, black mottling; little very fine sand at depth; medium stiffness, slight plasticity. Dry.		24-28	100	13/12	
-25							23/12	
-26							31/12	
-27								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-10A

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-28			CL-ML: Yellowish brown CLAY and black SILT; very stiff, slightly plastic, trace medium sand. Dry.		28-32	100	40/12 15/12	BEGIN CARBONATE ZONE
-29							31/12	
-30			ML: Dark yellowish brown (10 YR 4/6) with black striations SILT; some clay, low plasticity; dense.		30-34	83	12/12	
-31			CL-ML: Light brownish gray (10 YR 6/2) CLAY and SILT; little fine gravel; medium plasticity, slightly moist.				21/12	
-32			GM: Very pale brown (10 YR 7/4) SILT and fine to medium GRAVEL; some clay, moist.				22/12	
-33							24/12	
-34			GP: Very pale brown (10 YR 8/3) medium GRAVEL; some coarse sand, little silt. Wet.		34-38	63	15/12	
-35							8/12	
-36							7/12	
-37							5/12	
-38			GP: Very pale brown coarse SAND and medium GRAVEL; little silt, more silt at depth. Wet.		38-40	100	9/12	
-39							11/12	
-40			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-10B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/24/2007

Date Completed: 4/25/2007

Depth of Hole (ft): 55.00

Boring/Well: MONITORING WELL

Elevation (ft): 29.32

Northing (m): 867937.12

Easting (m): 761760.62

UTM NAD83

Gauged Depth to Water (ft): 25.02

Conditions: Asphalt

Comments: Buchanan, on north side of DPW complex

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Asphalt		0-4	42	15/12	
-1			SM: Very dark gray (7.5 YR 3/1) to bluish gray (Gley 2 6/1) coarse SAND; some silt, some fine gravel, dry.				18/12	
-2			SP: Black (10 YR 2/1) and yellowish brown (10 YR 5/6) fine SAND; trace medium gravel.				15/12	
-3			CL: Yellowish brown CLAY; dense, medium plasticity; trace fine gravel.				18/12	
-4			CL: Dark yellowish brown (10 YR 3/4) CLAY; medium plasticity, trace fine gravel. Slightly moist.		4-8	33	11/12	
-5			GW: Yellow (10 YR 7/6) coarse, subangular GRAVEL; trace medium sand and trace clay. Wet.				21/12	
-6							32/12	
-7							40/12	
-8			GW: Yellow coarse GRAVEL; little clay, trace fine sand.		8-12	33	16/12	
-9			CL: Brownish yellow (10 YR 6/6) to strong brown (7.5 YR 4/6) CLAY; dense, medium plasticity; little silt, trace medium sand. Dry.				16/12	
-10							25/12	
-11							27/12	
-12			CL-ML: Alternating/mottled coloring: yellowish red (5 YR 4/6), yellowish brown (10 YR 5/6) SILT and white CLAY; medium plasticity, very stiff; trace fine sand, dry.		12-16	100	14/12	
-13							28/12	
-14							41/12	
-15							42/12	
-16			UNKNOWN: NO RECOVERY		16-20	0	17/12	
-17							21/12	
-18							30/12	
-19							39/12	
-20			CL-ML: Yellowish red (5 YR 4/6) SILT and yellowish brown (10 YR 5/6) CLAY; (little wet fine gravel/coarse sand at 6"). Stiff.		20-24	100	17/12	
-21							23/12	
-22			CL: White, very pale brown (10 YR 8/2) and brownish yellow (10 YR 6/6) CLAY; some silt, mottled with reds and blacks (organics); stiff, dry.				28/12	
-23							33/12	
-24			CL: Yellowish brown to brown CLAY; some silt, black mottling; little very fine sand at depth; medium stiffness, slight plasticity. Dry.		24-28	100	13/12	
-25							23/12	
-26							31/12	
-27								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-10B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-28			CL-ML: Yellowish brown CLAY and black SILT; very stiff, slightly plastic, trace medium sand. Dry.		28-32	100	40/12 15/12	
-29							31/12	
-30							42/12	
-31			ML: Yellow (10 YR 7/6) SILT; some clay and black silty organics; trace medium sand. Dry.				44/12	
-32					32-36	100	13/12	
-33			CL-ML: Yellow with black striations SILT and CLAY; medium density and slightly plastic. Dry.				23/12	
-34							26/12	
-35							23/12	
-36			CL-ML: Brownish yellow CLAY and SILT; some fine sand, moist.		36-40	100	11/12	BEGIN CARBONATE ZONE
-37			ML: Yellow, brownish yellow SILT; trace clay and fine sand, stiffening to bottom. Moist.				14/12	
-38							18/12	
-39							20/12	
-40					40-44	100		
-41			CL-ML: Brownish yellow to yellow SILT and CLAY; stiff; trace of fine white gravel and black organics. Slightly moist.					
-42								
-43								
-44			CL: Brownish yellow CLAY; medium plasticity; soft; some silt, trace fine gravel, becoming some fine gravel at depth. Slightly moist.		44-48	100	30/12	
-45			ML: Yellowish brown SILT; some fine sand, little subangular gravel; moist.				36/12	
-46			GM: Grayish brown (10 YR 5/2) to pale brown (10 YR 6/3) to light gray (10 YR 7/2) medium GRAVEL, coarse SAND, and SILT; very moist, drying some at depth.				49/12	
-47							85/12	
-48					48-51	100	50	
-49			GM: Light gray, white fine to coarse GRAVEL and SILT; some coarse sand. Very dense, mostly dry.				100/24	
-50								
-51								
-52			ML: Greenish gray (Gley 1 5/1) and yellowish brown (10 YR 5/6) SILT; trace medium sand/fine gravel; very stiff, dry.		52-55	100		
-53								
-54								
-55			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-11A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 5/15/2007

Date Completed: 5/15/2007

Depth of Hole (ft): 30.00

Boring/Well: MONITORING WELL

Elevation (ft): 11.93

Northing (m): 868463.45

Easting (m): 762208.24

UTM NAD83

Gauged Depth to Water (ft): 7.65

Conditions: Grass

Comments: Buchanan, near El Toro Creek

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			SILTY LOAM: Organics		0-4	63	6/12	
-1			CL: Dark yellowish brown (10 YR 4/4) CLAY to dark grayish brown (10 YR 4/2) clay, little silt; little fine to medium gravel, dry.				11/12	
-2							23/12	
-3							19/12	
-4			CL: Dark greenish gray (Gley 1 4/1) CLAY; some silt; medium plasticity, soft. Dry.		4-8	58	7/12	
-5			CL: Yellowish brown (10 YR 5/6) CLAY; mottled with bluish gray, red clay; little silt; highly plastic, soft. Dry.				9/12	
-6							11/12	
-7							11/12	
-8			CL: Yellowish brown, light bluish gray (Gley 2 7/1) some yellowish red (5 YR 4/6) CLAY; highly plastic, soft, dry.		8-12	83	5/12	
-9							8/12	
-10							12/12	
-11			CL: Light bluish gray CLAY; little silt, trace fine white gravel. Medium plasticity, soft, dry.				14/12	
-12			CL: Light bluish gray and yellowish brown CLAY; some silt, soft; stiffening at depth. Low plasticity, dry.		12-16	100	10/12	
-13							14/12	
-14							21/12	
-15							24/12	
-16			CL: Yellowish brown to light bluish gray CLAY; some silt; medium plasticity, slightly moist.		16-20	42	8/12	
-17			CL-ML: Light bluish gray to yellowish brown CLAY and SILT; some fine sand, low plasticity; slightly moist.				15/12	
-18			SW: Light bluish gray fine SAND; moist.				18/12	
-19							25/12	
-20			SW: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) fine to medium SAND; trace silt, moist.		20-24	100	13/12	
-21			SC: Brownish yellow (10 YR 6/8) and black CLAY and very pale brown fine SAND; low plasticity, moist.				16/12	
-22							20/12	
-23			CL: Brownish yellow and black CLAY; little silt, trace medium sand. Slightly moist.				20/12	
-24			CL-ML: Brownish yellow and black CLAY and SILT; mostly dry.		24-27.67	80	4/12	
-25			SM: Brownish yellow fine SAND and SILT; trace clay. Soft, very moist.				4/12	
-26			GM: Very pale brown (10 YR 8/2), little yellow fine GRAVEL and SILT; fairly stiff, slightly moist.				33/12	
-27							100/8	
-28			GM: Very pale brown (10 YR 7/4) fine GRAVEL and coarse SAND; some silt, stiff; very moist.		28-29	100	100/12	
-29			END OF SAMPLING					
-30								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-11B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 5/11/2007

Date Completed: 5/14/2007

Depth of Hole (ft): 56.00

Boring/Well: MONITORING WELL

Elevation (ft): 11.40

Northing (m): 868472.99

Easting (m): 762204.53

UTM NAD83

Gauged Depth to Water (ft): 7.05

Conditions: Grass

Comments: Buchanan, near El Toro Creek

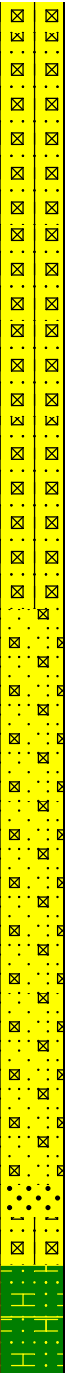
Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			SILTY LOAM: Organics		0-4	63	6/12	
-1			CL: Dark yellowish brown (10 YR 4/4) CLAY to dark grayish brown (10 YR 4/2) clay, little silt; little fine to medium gravel, dry.				11/12	
-2							23/12	
-3							19/12	
-4			CL: Dark greenish gray (Gley 1 4/1) CLAY; some silt; medium plasticity, soft. Dry.		4-8	58	7/12	
-5			CL: Yellowish brown (10 YR 5/6) CLAY; mottled with bluish gray, red clay; little silt; highly plastic, soft. Dry.				9/12	
-6							11/12	
-7							11/12	
-8			CL: Yellowish brown, light bluish gray (Gley 2 7/1) some yellowish red (5 YR 4/6) CLAY; highly plastic, soft, dry.		8-12	83	5/12	
-9							8/12	
-10							12/12	
-11			CL: Light bluish gray CLAY; little silt, trace fine white gravel. Medium plasticity, soft, dry.				14/12	
-12			CL: Light bluish gray and yellowish brown CLAY; some silt, soft; stiffening at depth. Low plasticity, dry.		12-16	100	10/12	
-13							14/12	
-14							21/12	
-15							24/12	
-16			CL: Yellowish brown to light bluish gray CLAY; some silt; medium plasticity, slightly moist.		16-20	42	8/12	
-17			CL-ML: Light bluish gray to yellowish brown CLAY and SILT; some fine sand, low plasticity, slightly moist.				15/12	
-18			SW: Light bluish gray fine SAND; moist.				18/12	
-19							25/12	
-20			SW: Yellow (10 YR 7/6) to brownish yellow (10 YR 6/6) fine SAND; little silt, wet.		20-24	100	13/12	
-21							19/12	
-22							19/12	
-23			CL: Brownish yellow CLAY; some fine sand, little silt. Very moist.				20/12	
-24			CL-ML: Brownish yellow to dark yellowish brown (10 YR 4/4) CLAY and SILT; trace fine sand, fairly stiff. Moist.		24-28	100	9/12	
-25							15/12	
-26							18/12	
-27			SW: Brownish yellow fine SAND; little clay, wet.					BEGIN CARBONATE ZONE



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-11B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name	
				VOC (ppm)					
-28			GM: Very pale brown to light gray (10 YR 7/3, 7/2) fine GRAVEL; some silt, dense; very moist.		28-30	100	48/12		
-29			GM: Light gray to very pale brown fine GRAVEL; some coarse sand and silt; dense, wet.				59/12		
-30							100/12		
-31									
-32									
-33			GM: Very pale brown fine GRAVEL; some coarse sand and silt; dense, wet.		32-33	100	100/12		
-34									
-35			GM: Very pale brown, yellowish brown (10 YR 5/8) fine GRAVEL; little silt, dense; wet.		34-35.9	100	54/12		
-36							100/11		
-37					GM: Very pale brown, yellowish brown fine to medium GRAVEL; some silt, little coarse sand, little clay. Dense, very moist.	36-40	100		65/12
-38									57/12
-39									88/12
-40							80/12		
-41					GP: Very pale brown fine to medium GRAVEL and coarse SAND; trace silt. Wet.	40-43	72		22/12
-42									20/12
-43									100/12
-44									
-45					GP: Very pale brown (10 YR 8/4, 8/3) fine to coarse GRAVEL and coarse SAND; little/trace silt; wet.	44-48	42		13/12
-46									6/12
-47									5/12
-48									13/12
-49					GP: Very pale brown fine GRAVEL and coarse SAND; trace silt, wet.	48-52	63		6/12
-50									7/12
-51									2/12
-52									1/12
-53					SP: Yellowish brown coarse SAND; some fine gravel, little silt. Wet.	52-56	81		14/12
-54					GM: Yellowish brown SILT and fine GRAVEL; little clay, moist.				40/12
-55					CL-ML: Brownish yellow CLAY and SILT; trace fine gravel; slightly moist to dry.				33/12
-56			CL-ML: Dark grayish brown (10 YR 4/2) CLAY and SILT to light bluish gray (Gley 2 8/1) silt; dry.			65/12			
END OF SAMPLING									



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-12A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/27/2007

Date Completed: 4/27/2007

Depth of Hole (ft): 36.00

Boring/Well: MONITORING WELL

Elevation (ft): 10.51

Northing (m): 868572.11

Easting (m): 761632.83

UTM NAD83

Gauged Depth to Water (ft): 6.19

Conditions: Asphalt

Comments: Buchanan, on Perimeter Road near light pole 062

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			ASPHALT: Asphalt		0-4	50	23/12	
-1			FILL: Bluish gray (Gley 2 5/1) and brown medium GRAVEL and SILT (fill); some medium sand.				30/12	
-2			SC-SM: Dark yellowish brown (10 YR 4/6) coarse SAND, SILT, and CLAY. Moist.				45/12	
-3			GW: Bluish gray coarse GRAVEL. Dry.				40/12	
-4			GP: Very pale brown medium GRAVEL and coarse SAND; little silt. Slightly moist.					
-5			GP: Very pale brown coarse SAND and fine GRAVEL; little silt. Moist.		4-8	50	13/12	
-6			CL-FILL: Bluish gray and yellowish brown (10 YR 5/4) CLAY; highly plastic, dry. (Fill material at 4 inches).				11/12	
-7							12/12	
-8			CL: Mottled red/blue/brown CLAY (LIMITED RECOVERY).		8-12	5	9/12	
-9							9/12	
-10							12/12	
-11							13/12	
-12			SM: Grayish brown medium SAND and SILT; wet.		12-16	83	7/12	
-13			CL: Highly mottled light bluish gray (Gley 2 7/1) with brownish yellow (10 YR 6/8) and red CLAY; medium plasticity, little silt. Dry.				12/12	
-14							16/12	
-15			CL-ML: Yellow (10 YR 7/6) and black SILT and CLAY; slightly plastic, low stiffness. Dry.				14/12	
-16			CL-ML: Yellow and black SILT and CLAY, dry.		16-20	100	10/12	
-17			ML: Brownish yellow/white SILT, little clay.					
			ML: Brownish yellow SILT; some clay, soft; slightly plastic, dry.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-12A

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-18							10/12	
-19							14/12	
-20			SP: Brownish yellow (10 YR 6/6) medium to coarse SAND and medium GRAVEL; little silt, wet.		20-24	83	5/12	BEGIN CARBONATE ZONE
-21			SW: Brownish yellow coarse SAND and medium GRAVEL; some silt, wet.				15/12	
-22			GP: Very pale brown coarse SAND and medium GRAVEL; trace silt, wet.				22/12	
-23							32/12	
-24			GP: Very pale brown medium to coarse GRAVEL; little coarse sand, shells evident. Wet.		24-28	13	5/12	
-25							1/12	
-26							2/12	
-27							1/12	
-28			SW: Light yellowish brown (10 YR 6/4) medium SAND; wet.		28-30	83	19/12	
-29							11/12	
-30			GW: Very pale brown medium to coarse GRAVEL; wet.		30-34	33	8/12	
-31			GP: Very pale brown coarse SAND and medium GRAVEL; wet.				5/12	
-32			SM: Light yellowish brown SAND and SILT; wet.				2/12	
-33							1/12	
-34			SW: Light yellowish brown coarse SAND; wet.		34-36	100	32/12	
-35			GM: Very pale brown, light yellowish brown coarse SAND, fine GRAVEL, and SILT; becoming drier with more silt at depth. Stiff, moist.				100/12	
-36			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-12B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/30/2007

Date Completed: 5/1/2007

Depth of Hole (ft): 56.00

Boring/Well: MONITORING WELL

Elevation (ft): 10.58

Northing (m): 868558.58

Easting (m): 761625.20

UTM NAD83

Gauged Depth to Water (ft): 6.16

Conditions: Asphalt

Comments: Buchanan, on Perimeter Road near light pole 062

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			ASPHALT: Asphalt		0-4	50	23/12	
-1			FILL: Bluish gray (Gley 2 5/1) and brown medium GRAVEL and SILT (fill); some medium sand. SC-SM: Dark yellowish brown (10 YR 4/6) coarse SAND, SILT, and CLAY. Moist.				30/12	
-2			GW: Bluish gray coarse GRAVEL. Dry. GW: Very pale brown (10 YR 8/3) coarse, angular GRAVEL. Dry.				45/12	
-3			GP: Very pale brown medium GRAVEL and coarse SAND; little silt. Slightly moist.				40/12	
-4			GP: Very pale brown coarse SAND and fine GRAVEL; little silt. Moist.		4-8	50	13/12	
-5			CL-FILL: Bluish gray and yellowish brown (10 YR 5/4) CLAY; highly plastic, dry. (Fill material at 4 inches).				11/12	
-6							12/12	
-7							16/12	
-8			CL: Mottled red/blue/brown CLAY (LIMITED RECOVERY).		8-12	5	9/12	
-9							9/12	
-10							12/12	
-11							13/12	
-12			SM: Grayish brown medium SAND and SILT; wet.		12-16	83	7/12	
-13			CL: Highly mottled light bluish gray (Gley 2 7/1) with brownish yellow (10 YR 6/8) and red CLAY; medium plasticity, little silt. Dry.				12/12	
-14							16/12	
-15			CL-ML: Yellow (10 YR 7/6) and black SILT and CLAY; slightly plastic, low stiffness. Dry.				14/12	
-16			CL-ML: Yellow and black SILT and CLAY, dry.		16-20	100	10/12	
-17			ML: Brownish yellow/white SILT, little clay. ML: Brownish yellow SILT; some clay, soft; slightly plastic, dry.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-12B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-18							10/12	
-19							14/12	
-20			SP: Brownish yellow (10 YR 6/6) medium to coarse SAND and medium GRAVEL; little silt, wet.		20-24	83	5/12	BEGIN CARBONATE ZONE
-21			SW: Brownish yellow coarse SAND and medium GRAVEL; some silt, wet.				15/12	
-22			GP: Very pale brown coarse SAND and medium GRAVEL; trace silt, wet.				22/12	
-23							32/12	
-24			GP: Very pale brown medium to coarse GRAVEL; little coarse sand, shells evident. Wet.		24-28	13	5/12	
-25							1/12	
-26							2/12	
-27							1/12	
-28			SW: Light yellowish brown (10 YR 6/4) medium SAND; wet.		28-30	83	19/12	
-29							11/12	
-30			GW: Very pale brown medium to coarse GRAVEL; wet.				8/12	
-31			GP: Very pale brown coarse SAND and medium GRAVEL; wet.		30-34	33	5/12	
-32			SM: Light yellowish brown SAND and SILT; wet.				2/12	
-33							1/12	
-34			SW: Light yellowish brown coarse SAND; wet.		34-36	100	32/12	
-35			GM: Very pale brown, light yellowish brown coarse SAND, fine GRAVEL, and SILT; becoming drier with more silt at depth. Stiff, moist.				100/12	
-36			GM: Very pale brown (10 YR 7/4) to light yellowish brown (10 YR 6/4) medium GRAVEL, coarse SAND, and SILT; moist.		36-37.67	100	34/12	
-37			CL: Light yellowish brown to brown (10 YR 5/3) CLAY; some silt, little coarse sand, trace fine white gravel. Medium plasticity, slightly moist.				100/8	
-38								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-12B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-39								
-40			GM: Very pale brown (10 YR 8/3) medium angular GRAVEL, coarse SAND, and SILT; little brownish yellow (10 YR 6/8) coloration. Medium density, very moist.		40-40.83	100	100/10	BEGIN CARBONATE ZONE
-41								
-42			GM: Yellow (10 YR 7/6), very pale brown, and brownish yellow fine GRAVEL, coarse SAND, and CLAY; little silt, dense, moist.		42-43	100	100/12	
-43								
-44			GM: Very pale brown and brownish yellow SILT and fine GRAVEL; Moist.		44-45	100	100/12	
-45			ML: Brownish yellow SILT; some fine gravel; dense, slightly moist.					
-46			GM: Very pale brown (10 YR 8/3) and greenish gray (Gley 1 6/1) medium GRAVEL and CLAY; some coarse sand, moist.		46-48	83	98/12	
-47			GM: Very pale brown (10 YR 7/4, 8/3) coarse SAND and medium GRAVEL; some silt, trace clay. Moist.				20/12	
-48			SM: Very pale brown coarse SAND and SILT; trace clay, moist.		48-51.83	100	61/12	
-49			GP: Very pale brown coarse SAND and fine to medium GRAVEL (with shells); little silt, wet.				73/12	
-50							91/12	
-51							100/10	
-52			GP: Very pale brown (10 YR 8/3) medium GRAVEL and coarse SAND; little silt, wet.		52-53.67	100	82/12	
-53			GM: Very pale brown to yellow (10 YR 7/6) medium GRAVEL and SILT, siltier at depth; moist.				100/8	
-54			ML: Very pale brown (10 YR 7/4) to brownish yellow (10 YR 6/6) SILT and fine GRAVEL; slightly moist.		54-55.83	100	63/12	
-55			ML: Brownish yellow SILT; trace fine gravel, slightly moist.				100/10	
-56			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-13A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 5/8/2007

Date Completed: 5/8/2007

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 10.25

Northing (m): 869204.47

Easting (m): 762397.50

UTM NAD83

Gauged Depth to Water (ft): 5.69

Conditions: Grass

Comments: Buchanan, grass near back gate on Perimeter Road, near LP 067

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			ML: Brown (10 YR 4/3) SILT and organics; some clay, trace fine sand. Dry.		0-4	50	9/12	
-1			FILL: Black aggregate.				11/12	
-2			SM: Yellowish brown (10 YR 5/8) medium SAND; some silt, little coarse gravel. Moist.				7/12	
-3							6/12	
-4			CH: Bluish gray (Gley 2 5/1) to bluish grey (Gley 2 6/1) to dark bluish gray (Gley 2 4/1) CLAY; soft, high plasticity; little/trace reddish brown silt; moist.		4-8	83	2/12	
-5							4/12	
-6							7/12	
-7							10/12	
-8			CH: Dark bluish gray, highly plastic CLAY.		8-12	100	7/12	4
-9			SW: Bluish gray to yellowish brown to white fine SAND; wet.				14/12	
-10							12/12	
-11			CH: Yellowish brown CLAY; some mottling; highly plastic, moist.				7/12	
-12			CH: Brownish yellow (10 YR 6/6) to light olive brown (2.5 Y 5/4) CLAY; trace light bluish clay; trace black clay; highly plastic, slightly moist, medium stiffness.		12-16	63	5/12	
-13							6/12	
-14							11/12	
-15							20/12	
-16			CL: Reddish brown (5 YR 4/4) with mottles of black, bluish gray, brownish yellow CLAY; little silt; medium plasticity, dense. Dry.		16-20	75	11/12	
-17							20/12	
-18							31/12	
-19								



Log of Boring: **MW-13A**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-20			CL: Reddish brown mottled CLAY; medium plasticity and stiffness; dry.		20-24	15	28/12	
-21							10/12	
-22							20/12	
-23							28/12	
-24			SM: White with black striations fine SAND and SILT; trace clay. Moist.		24-28	100	34/12	
-25			CL: Yellowish brown CLAY; stiff; some fine sand, trace white/black striations. Moist.				9/12	
-26							13/12	
-27							14/12	
-28			CL: Yellowish brown (10 YR 5/6) CLAY; soft, dry.		28-32	79	17/12	
-29			SC: White and black fine SAND and CLAY; moist.				6/12	
-30			SC: Yellowish brown (10 YR 5/8) fine SAND and CLAY; little silt; soft, moist.				11/12	
-31			GW: Dark yellowish brown (10 YR 3/6) fine to medium GRAVEL; wet.		30-34	50	4/12	
-32			SW: Yellowish red (5 YR 4/6) fine SAND; little clay, little silt. Wet.				5/12	
-33			SC: Yellowish red (5 YR 5/8, 4/6) with trace brownish yellow (10 YR 6/8) fine SAND and CLAY; trace silt; very soft, very moist.				6/12	
-34							10/12	
-35								
-36			CL: Yellowish red CLAY; some fine sand, little silt; very soft, medium plasticity, very moist.		36-40	50	7/12	
-37							11/12	
-38			SC: Yellowish red fine SAND; some clay, little silt; soft, low plasticity, very moist/wet.				20/12	
-39							29/12	
-40			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-13B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 5/2/2007

Date Completed: 5/4/2007

Depth of Hole (ft): 64.00

Boring/Well: MONITORING WELL

Elevation (ft): 10.31

Northing (m): 869213.05

Easting (m): 762389.97

UTM NAD83

Gauged Depth to Water (ft): 5.87

Conditions: Grass

Comments: Buchanan, grass on Perimeter Road corner near back gate, LP 067

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			ML: Brown (10 YR 4/3) SILT and organics; some clay, trace fine sand. Dry.		0-4	50	9/12	
-1			FILL: Black aggregate.				11/12	
-2			SM: Yellowish brown (10 YR 5/8) medium SAND; some silt, little coarse gravel. Moist.				7/12	
-3							6/12	
-4			CH: Bluish gray (Gley 2 5/1) to bluish grey (Gley 2 6/1) to dark bluish gray (Gley 2 4/1) CLAY; soft, high plasticity; little/trace reddish brown silt; moist.		4-8	83	2/12	
-5							4/12	
-6							7/12	
-7							10/12	
-8			CH: Dark bluish gray, highly plastic CLAY.		8-12	100	7/12	4
-9			SW: Bluish gray to yellowish brown to white fine SAND; wet.				14/12	
-10							12/12	
-11			CH: Yellowish brown CLAY; some mottling; highly plastic, moist.				7/12	
-12			CH: Brownish yellow (10 YR 6/6) to light olive brown (2.5 Y 5/4) CLAY; trace light bluish clay; trace black clay; highly plastic, slightly moist, medium stiffness.		12-16	63	5/12	
-13							6/12	
-14							11/12	
-15							20/12	
-16			CL: Reddish brown (5 YR 4/4) with mottles of black, bluish gray, brownish yellow CLAY; little silt; medium plasticity, dense. Dry.		16-20	75	11/12	
-17							20/12	
-18							31/12	
-19								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-13B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-20			CL: Reddish brown mottled CLAY; medium plasticity and stiffness; dry.		20-24	15	28/12	
-21							10/12	
-22							20/12	
-23							28/12	
-24			SM: White with black striations fine SAND and SILT; trace clay. Moist.		24-28	100	34/12	
-25			CL: Yellowish brown CLAY; stiff; some fine sand, trace white/black striations. Moist.				9/12	
-26							13/12	
-27							14/12	
-28			CL: Yellowish brown (10 YR 5/6) CLAY; soft, dry.		28-32	79	17/12	
-29			SC: White and black fine SAND and CLAY; moist.				6/12	
-30			SC: Yellowish brown (10 YR 5/8) fine SAND and CLAY; little silt; soft, moist.				11/12	
-31			GW: Dark yellowish brown (10 YR 3/6) fine to medium GRAVEL; wet.				13/12	
-32			SW: Yellowish red (5 YR 4/6) fine SAND; little clay, little silt. Wet.				11/12	
-33			SW: Yellowish red fine SAND; trace silt. Wet.		32-36	75	7/12	
-34			ML: Yellowish red SILT; little clay, trace fine sand. Very moist.				10/12	
-35			CL-ML: Yellowish red CLAY and SILT; soft; some fine sand. Moist.				15/12	
-36							15/12	
-37			ML: Yellowish red SILT; some fine sand; (intervals of fine sand, some silt); little clay; soft, wet.		36-40	63	10/12	
-38							13/12	
-39							25/12	
-40							24/12	
-41			CL-ML: Yellowish red (5 YR 4/6) CLAY and SILT; medium plasticity, stiff; trace fine sand, trace organics, slightly moist.		40-44	79	17/12	
-42							31/12	
							51/12	

Note: Unless otherwise noted VOC reading = 0.



Log of Boring: **MW-13B**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-43							51/12	
-44			CL: Yellowish red CLAY; some silt, stiff.		44-48	83	17/12	
-45			CL: Yellowish red CLAY; some fine sand, little silt; softening, moist.				29/12	
-46			SW: Yellowish red fine SAND; little silt. Wet.				35/12	
-47			CL: Yellowish red CLAY; some silt and fine sand; slightly stiff, moist.				34/12	
-48			OL: Olive yellow (2.5 Y 6/6) SILT; some black organics, little yellowish red clay. Stiff, dry.					
-49			OH: Greenish gray (Gley 2 6/1), black, yellowish red CLAY; some silt, stiff.		48-52	96	21/12	BEGIN CARBONATE ZONE
-50			ML: Very pale brown (10 YR 7/3, 7/4, 8/2) SILT; little to some fine to medium gravel, trace coarse sand. Slightly moist.				43/12	
-51							40/12	
-52			ML: Greenish gray to yellow (10 YR 7/6) SILT; little clay, stiff, dry.				39/12	
-53			ML: Yellow (10 YR 7/8) and brownish yellow (10 YR 6/8) SILT; little clay, trace fine gravel. Stiff, dry.		52-56	83	19/12	
-54			GM: Yellow to very pale brown SILT and fine to coarse GRAVEL; little clay, trace coarse sand; wet.				15/12	
-55							9/12	
-56			CL-ML: Brown CLAY and SILT.				5/12	
-57			GP: Very pale brown coarse SAND and medium GRAVEL; wet.		56-60	17	0/12	
-58							3/12	
-59							0/12	
-60			GP: Very pale brown fine to medium GRAVEL and coarse SAND; little silt, wet.		60-60.67	100	100/8	
-61								
-62			GP: Very pale brown coarse SAND and fine GRAVEL; some silt, moist.		62-64	67	57/12	
-63							54/12	
-64			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-14A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 12/12/2007

Date Completed: 12/13/2007

Depth of Hole (ft): 44.00

Boring/Well: MONITORING WELL

Elevation (ft): 22.16

Northing (m): 867653.23

Easting (m): 762300.5

UTM NAD83

Gauged Depth to Water (ft): 9.50

Conditions: Grass

Comments: Buchanan, east of DPW near creek

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			NS: No lithology collected					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
-35	☒	☒	GP: Very pale brown (10 YR 8/3) fine to coarse GRAVEL; some coarse sand; little silt; very dense, wet.		34-38	100	100/12	
-36	☒	☒						
-37	☒	☒						
-38	☒	☒						
-39	☒	☒	GM: Very pale brown (10 YR 7/4, 8/3) GRAVEL; some yellowish brown (10 YR 5/8) silt; little coarse sand, wet.		39-43	100	100/12	
-40	☒	☒						
-41	☒	☒						
-42	☒	☒						
-43	☒	☒						
-44	☒	☒						
END OF SAMPLING								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-14B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 12/7/2007

Date Completed: 12/12/2007

Depth of Hole (ft): 60.00

Boring/Well: MONITORING WELL

Elevation (ft): 21.71

Northing (m): 867665.24

Easting (m): 762299.44

UTM NAD83

Gauged Depth to Water (ft): 0.00

Conditions: Grass

Comments: Buchanan, east of DPW near creek

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			OL: Dark yellowish brown (10 YR 5/6) SILT (organics); some clay, soft, mostly dry.		0-4	52	4/12	end
-1			CL-ML: Striated/mottled white (10 YR 8/1), yellowish red (5 YR 4/6) and yellowish brown (10 YR 5/8) SILT and CLAY; low plasticity, mostly dry.				9/12	
-2			CL: Grayish brown (10 YR 5/2) CLAY; some silt, trace fine black (10 YR 2/1) gravel, soft; mostly dry.				12/12	
-3							13/12	
-4			CH: Mottled yellowish brown (10 YR 5/6) and light gray (10 YR 7/1) CLAY; very soft, medium to high plasticity; little fine round gravel at depth. Moist.		4-8	83	6/12	
-5							9/12	
-6							14/12	
-7							14/12	
-8			CH: Mottled yellowish brown (10 YR 5/6) and light bluish gray (Gley 2 7/1) CLAY; trace yellowish red (5 YR 4/6) silt; high plasticity, very soft, dry.		8-12	100	5/12	
-9							8/12	
-10							12/12	



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-14B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-11							17/12	
-12			GW: Dark reddish brown (5 YR 3/4) coarse GRAVEL; little silt, dry. CL: Light bluish gray (Gley 2 7/1) CLAY; slightly stiff; medium plasticity, dry. GW: Dark reddish brown (5 YR 3/4) fine to coarse GRAVEL; little silt, dry. CL: Mottled white (10 YR 8/1) and yellowish red (5 YR 4/6) CLAY; little fine sand, trace remnant organics; trace fine gravel, medium plasticity, medium stiff, dry.		12-16	100	7/12	
-13							12/12	
-14							17/12	
-15							20/12	
-16			CL: Mottled light bluish gray (Gley 2 7/1) yellowish red (5 YR 4/6) and brownish yellow (10 YR 6/8) CLAY; some silt, stiff, medium plasticity; dry.		16-20	100	7/12	
-17							16/12	
-18							20/12	
-19							20/12	
-20			CL-ML: Mottled brownish yellow (10 YR 6/8) and black (10 YR 2/1) CLAY; some silt; fairly stiff, low to medium plasticity, mostly dry.		20-24	100	7/12	
-21							15/12	
-22							17/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-14B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-23							18/12	
-24			SM: Brownish yellow (10 YR 6/8) SILT and fine SAND; trace black (10 YR 2/1) organics, moist.		24-28	92	8/12	
-25			CL-ML: Yellowish brown (10 YR 5/8) CLAY and SILT; some black (10 YR 2/1) silt, mostly dry.				19/12	
-26			GM: Very pale brown (10 YR 7/4) fine GRAVEL, SILT and coarse SAND; dense, dry.				100/12	
-27							100/12	
-28			GP: Very pale brown fine GRAVEL; some coarse sand, little silt; dense, moist to wet.		28-30	1100	100/12	
-29								
-30			SM: Greenish gray (Gley 1 6/1) coarse SAND and SILT; little yellowish brown (10 YR 5/8) silt; moist.		30-34	56	22/12	
-31			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; stiff, mostly dry.				33/12	
-32							100/12	
-33								
-34			GM: Very pale brown (10 YR 8/2) SILT and fine GRAVEL; trace clay and coarse sand; dense, moist.		34-36	100	100/12	
-35								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-14B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-36			GM: Very pale brown (10 YR 7/4) SILT and fine GRAVEL; little yellowish brown (10 YR 5/8) silt; moist.		36-38	100	100/12	
-37								
-38			GP: Very pale brown (10 YR 7/4) fine to coarse GRAVEL; some coarse sand, little silt; dense, wet.		38-42	100	100/12	
-39								
-40								
-41								
-42			GP: Very pale brown fine to coarse GRAVEL and coarse SAND; some silt, dense, wet.		42-46	100	100/12	
-43			ML: Very pale brown (10 YR 7/4) SILT; some fine gravel, very moist.					
-44								
-45								
-46			GP: Very pale brown (10 YR 7/4) coarse GRAVEL and SILT; some coarse sand, very moist.		46-50	100	100/12	
-47			ML: Greenish gray (Gley 2 6/1) SILT; some fine gravel, moist.					
-47			GM: Bluish gray (Gley 2 6/1) fine to coarse angular GRAVEL and SILT; dense, moist.					
-48								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-14B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-49								
-50			GP: Bluish gray (Gley 2 6/1) coarse angular GRAVEL and coarse SAND; little silt, dense, very moist.		50-54	100	100/12	
-51								
-52								
-53								
-54			GW: Very pale brown (10 YR 7/4) fine GRAVEL; little silt, little coarse sand; very moist. GP: Bluish gray (Gley 2 6/1) fine GRAVEL and coarse SAND; little silt, very moist. GP: Gray (10 YR 6/1) and light gray (10 YR 7/1) fine to coarse GRAVEL and coarse SAND; trace silt, wet.		54-58	100	100/12	
-55								
-56								
-57								
-58			SM: Bluish gray (Gley 2 6/1) fine SAND and SILT; wet. SW: Light greenish gray (Gley 2 8/1) fine SAND; some coarse gravel, little silt; wet.		58-62	100	69/12	
-59							100/12	
-60			END OF SAMPLING					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-15A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 11/16/2007

Date Completed: 11/26/2007

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 19.95

Northing (m): 867972.17 Easting (m): 762517.27 UTM NAD83

Gauged Depth to Water (ft): 14.97

Conditions: Grass

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			NS: No lithology collected					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33			CL-ML: Yellowish red (5 YR 5/6) CLAY and SILT; little fine sand, trace gravel; slightly moist.		32-36	100	14/12	CARBONATE ZONE
-34			SW: Yellowish brown (10 YR 5/6) fine SAND; moist.				21/12	
-35			CL: Yellowish brown (10 YR 5/6) CLAY; some silt, little coarse sand/fine gravel; slightly moist.				36/12	
-36			GM: Yellow (10 YR 8/6) SILT and fine white (10 YR 8/1) GRAVEL; little clay, little coarse sand; moist.		36-40	67	75/12	
-37			ML: Brownish yellow (10 YR 6/6) SILT; some fine to coarse gravel, moist.				24/12	
-38							22/12	
-39			GM: Very pale brown (10 YR 7/4) SILT and fine to coarse GRAVEL; very moist.				54/12	
-40			END OF SAMPLING				92/12	



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-15B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 11/13/2007

Date Completed: 11/14/2007

Depth of Hole (ft): 68.50

Boring/Well: BOREHOLE

Elevation (ft):

Northing (m): 0

Easting (m): 0

UTM NAD83

Gauged Depth to Water (ft): NA

Conditions: Grass

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			ML: Very dark grayish brown (10 YR 3/2) organic material (SILT); moist.		0-2	67	15/12	
			GW: Very pale brown (10 YR 7/4) coarse GRAVEL; (fill), dry.					
-1			CL: Light yellowish brown (10 YR 6/4) CLAY (fill); little fine gravel, dry.				6/12	
-2			CL: Light yellowish brown (10 YR 6/4) CLAY; little fine gravel. Dry.		2-4	58	8/12	
-3			CL: Gray (10 YR 5/1) little brown (10 YR 5/3) CLAY; highly plastic, soft; trace silt. Dry.				8/12	
-4			CL: Gray (10 YR 5/1) and brown (10 YR 5/3) CLAY; high plasticity, soft; little silt, trace black (10 YR 2/1) organics.		4-6	62	3/12	
-5							5/12	
-6			CL: Gray (10 YR 5/1) and brown (10 YR 5/3) CLAY; soft, medium plasticity; little silt, dry.		6-8	67	9/12	
-7			CL: Bluish gray (Gley 2 5/1) CLAY; high plasticity, soft; little yellowish brown (10 YR 5/6) silt. Dry.				9/12	
-8			CL: Brown (10 YR 4/3) and yellowish brown (10 YR 5/6) CLAY; medium plasticity, some silt. Dry, moistening at bottom.		8-10	38	4/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-15B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-9							5/12	
-10			CL: Highly mottled brown (10 YR 4/3), yellowish brown (10 YR 5/6) and reddish brown (5 YR 4/4) CLAY; highly plastic; fairly stiff, little silt, trace fine gravel. Mostly dry.		10-12	100	12/12	
-11							14/12	
-12			CL: Highly mottled light bluish gray (Gley 2 7/1), reddish brown (5 YR 4/4) and yellowish brown (10 YR 5/6) CLAY; trace to little medium white (10 YR 8/1) sand; dry.		12-14	100	7/12	
-13							14/12	
-14			CL: Light bluish gray (Gley 2 7/1) CLAY; highly plastic, stiff; little yellowish brown (10 YR 5/6) silt, trace fine sand. Dry.		14-16	100	19/12	
-15			ML: Light bluish gray (Gley 2 7/1) and yellowish brown (10 YR 5/6) SILT; stiff, little medium sand. Dry.				22/12	
-16			ML: Dark yellowish brown (10 YR 4/6) SILT; some clay, trace medium sand, stiff, dry.		16-18	100	12/12	
-17			CL: Light bluish gray (Gley 2 7/1) CLAY; some yellowish red (5 YR 4/6) silt, trace medium sand, stiff, dry.				23/12	
-18			CL-ML: Yellowish red (5 YR 4/6) SILT and CLAY; very stiff, trace medium sand. Dry.		18-20	83	25/12	
-19			CL-ML: Light bluish gray (Gley 2 7/1) CLAY and yellowish brown (10 YR 5/6) SILT; stiff, dry.				30/12	
			CL-ML: Yellowish brown (10 YR 5/6) CLAY and SILT; very stiff, medium plasticity; dry.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-15B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-20			CL-ML: Yellowish brown (10 YR 5/8) and light bluish gray (Gley 2 7/1) CLAY and SILT; little medium sand; stiff, dry.		20-22	100	11/12	
-21							18/12	
-22			SC-SM: Yellowish brown (10 YR 5/8) SILT, CLAY, and medium SAND; medium plasticity, slightly moist.					
-23			CL-ML: Mottled brownish yellow (10 YR 6/8), light bluish gray (Gley 2 7/1), little yellowish red (5 YR 4/6) CLAY and SILT; trace fine gravel, stiff; low plasticity, dry.		22-24	100	23/12	
-24							37/12	
-25			CL-ML: Strong brown (7.5 YR 5/6) some mottles of yellowish brown (10 YR 5/8) and yellowish red (5 YR 4/6) CLAY and SILT; trace to little fine-coarse gravel, stiff; dry.		24-26	100	14/12	
-26							21/12	
-27			CL-ML: Strong brown (7.5 YR 5/6) with light bluish gray (Gley 2 5/1) mottled CLAY; trace fine gravel (iron oxide); to brownish yellow (10 YR 5/8) SILT; some clay. Stiff, dry.		26-28	100	33/12	
-28							37/12	
-29			CL-ML: Strong brown (7.5 YR 5/6) to yellowish brown (10 YR 5/8) CLAY and SILT; fairly stiff, low plasticity; little black (10 YR 2/1) silt (organics). Dry.		28-30	100	9/12	
-30								
-31			CL: Yellowish brown (10 YR 5/8) with many black mottles CLAY; some silt, very stiff, medium plasticity, dry.		30-32	100	27/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-15B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-31							30/12	
-32			GC: Yellowish brown (10 YR 5/8) and reddish brown (5 YR 4/4) CLAY and fine to coarse GRAVEL; stiff, medium plasticity; dry.		32-34	92	11/12	
-33			CL: Yellowish brown (10 YR 5/8) with black mottled (10 YR 2/1) CLAY; some silt, trace coarse sand; stiff, dry.				15/12	
-34			CL: Yellowish brown (10 YR 5/8) CLAY; stiff, slightly plastic, dry.		34-36	100	47/12	
-35			ML: Yellow (10 YR 7/6) SILT; some fine white gravel, very stiff; very slight moisture.				71/12	
-36			ML: Yellowish brown (10 YR 5/8) SILT; little fine white (10 YR 8/1) gravel; moist.		36-38	96	32/12	
-37			GW: Yellow (10 YR 7/6) to very pale brown (10 YR 7/4) coarse GRAVEL; some coarse sand, trace clay. Wet.				63/12	
-38			GP: Very pale brown (10 YR 7/4) coarse GRAVEL, some coarse sand; little silt, wet.		38-40	100	34/12	
-39							52/12	
-40			ML: Very pale brown (10 YR 8/2) SILT; little yellowish brown (10 YR 5/8) silt, trace fine sand. Mostly dry.		40-42	100	52/12	
-41							100/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-15B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-42			ML: Very pale brown (10 YR 7/4) to greenish gray (Gley 2 6/1) SILT; to silt and fine sand to silt; stiff, slightly moist.		42-44	100	49/12	
-43							74/12	
-44			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/6) SILT; trace fine white (10 YR 8/1) gravel; stiff, dry.		44-46	67	13/12	
-45			ML: Greenish gray (Gley 1 6/1) to light gray (10 YR 7/2) SILT; some fine white gravel, stiff, dry.				43/12	
-46			UNKNOWN: NO RECOVERY		46-48	0	100/12	
-47								
-48			GM: Very pale brown (10 YR 7/4) and yellowish brown (10 YR 5/8) SILT and fine to coarse GRAVEL; very stiff, slightly moist.		48-50	100	49/12	
-49			ML: Greenish gray (Gley 1 6/1), little yellowish brown (10 YR 5/8) SILT; some fine white (10 YR 8/1) gravel, very stiff, slightly moist.				94/12	
-50			UNKNOWN: NO RECOVERY		50-51	0	100/12	
-51			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; little fine gravel, moist.		51-53	100	100/12	
-52			GM: Bluish gray (Gley 2 5/1) and greenish gray (Gley 2 5/1) fine GRAVEL; some silt, little coarse sand; stiff, slightly moist.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-15B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-53			ML: Greenish gray (Gley 2 5/1) and some yellowish brown (10 YR 5/8) SILT; some fine gravel, dense; very stiff, mostly dry.		53-55	100	100/12	
-54								
-55			GM: Greenish gray (Gley 2 6/1, 5/1) SILT; fine GRAVEL (shells) and coarse SAND; moist, dense.		55-57	100	100/12	
-56								
-57			GM: Greenish gray (Gley 2 6/1) SILT and fine GRAVEL; trace coarse gravel; very stiff, moist.		57-59	100	100/12	
-58								
-59								
-60			ML: Dark greenish gray (Gley 2 4/1) SILT; little fine gravel (shells); very stiff, mostly dry.		60-62	100	64/12	
-61							100/12	
-62								
-63			GM: Dark greenish gray (Gley 2 4/1) SILT and fine white GRAVEL (shells); very stiff, slightly moist.		63-65	100	100/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-15B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-64								
-65								
-66								
-67								
-68			ML: Dark greenish gray (Gley 2 4/1) SILT; some fine white (10 YR 8/1) gravel, little coarse sand (shells), stiff, slightly moist.		68-68.5	100	100/12	
			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-16A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 12/3/2007

Date Completed: 12/3/2007

Depth of Hole (ft): 45.00

Boring/Well: MONITORING WELL

Elevation (ft): 20.26

Northing (m): 868253.74

Easting (m): 762728.02

UTM NAD83

Gauged Depth to Water (ft): 14.69

Conditions: Gravel

Comments: Buchanan, near Vet Clinic

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			NS: No lithology collected					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
-35								
-36			CL: Strong brown (7.5 YR 5/8) CLAY; little silt, trace black (10 YR 2/1) organics, trace brownish yellow (10 YR 6/8) silt; little fine sand at depth; stiff; medium plasticity, dry.		35-39	100	13/12	
-37			SW: Dark brown (7.5 YR 3/4) to strong brown (7.5 YR 4/6) fine SAND; trace silt, loose; wet.				26/12	
-38							25/12	
-39							40/12	
-40								
-41								
-42			SW: Strong brown (7.5 YR 4/6) fine SAND; loose, wet.		41-45	100	18/12	
-43							29/12	
-44			CL: Strong brown (7.5 YR 4/6) CLAY; striations of yellowish brown (10 YR 5/8) and black (10 YR 2/1) clay; trace fine sand, stiff, moist.				57/12	
-45			SM: Strong brown (7.5 YR 4/6) SILT and fine SAND; some clay very moist.				49/12	
			END OF SAMPLING					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-16B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 11/30/2007

Date Completed: 12/3/2007

Depth of Hole (ft): 62.00

Boring/Well: MONITORING WELL

Elevation (ft): 20.90

Northing (m): 868266.63

Easting (m): 762733

UTM NAD83

Gauged Depth to Water (ft): 15.69

Conditions: Gravel

Comments: Buchanan, near Vet Clinic

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			GW: GRAVEL surface.		0-4	67	11/12	
-1			CL-ML: Very dark grayish brown (10 YR 3/2) SILT and CLAY; little fine gravel and organics, dry.				23/12	
-2			CL-ML: Yellowish brown (10 YR 5/8) SILT and CLAY; some little fine gravel, trace red (7.5 YR 4/8) silt; low plasticity, dry.				31/12	
-3							21/12	
-4			CL-ML: Yellowish brown (10 YR 5/8) SILT and CLAY; soft, medium plasticity; little coarse sand; little red (7.5 YR 4/8) silt.		4-8	62	7/12	
-5			CL: Dark bluish gray (Gley 2 4/1) to bluish gray (Gley 2 5/1) CLAY; some yellowish brown (10 YR 5/8) silt; trace coarse white (10 YR 8/1) gravel; soft, medium plasticity, dry.				6/12	
-6							13/12	
-7							14/12	
-8			CH: Bluish gray (Gley 2 5/1) to dark bluish gray (Gley 2 4/1) CLAY; little yellowish brown (10 YR 5/8) silt, trace organics, very soft; high plasticity, dry.		8-12	100	6/12	
-9							12/12	
-10							15/12	
-11			CH: Bluish gray (Gley 2 5/1) and yellowish brown (10 YR 5/8) CLAY; some to little fine sand; becoming light bluish gray (Gley 2 8/1) at depth; very soft, high plasticity, dry.				15/12	
-12			CL: Bluish gray (Gley 2 5/1), light bluish gray (Gley 2 4/1) and yellowish brown (10 YR 5/8) CLAY; some to little fine sand, some silt; medium plasticity, fairly soft. Dry.		12-16	100	6/12	
-13							11/12	
-14							19/12	
-15							17/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-16B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-16			CL-ML: Yellowish brown (10 YR 5/8) and bluish gray (Gley 2 5/1) CLAY and SILT; little fine sand, slightly soft to medium stiffness; medium plasticity, dry.		16-20	100	7/12	
-17							18/12	
-18			CL-ML: Mottled bluish gray (Gley 2 5/1), yellowish brown (10 YR 5/8) and red (7.5 YR 4/8) CLAY and SILT; little fine sand; stiff, medium plasticity; dry.				23/12	
-19							29/12	
-20			CL-ML: Mottled yellowish brown (10 YR 5/8), bluish gray (Gley 2 6/1), some red (2.5 YR 4/8) CLAY and SILT; stiff, medium plasticity; dry.		20-24	100	12/12	
-21							16/12	
-22							23/12	
-23							26/12	
-24			CL: Mottled bluish gray (Gley 2 6/1), yellowish brown (10 YR 5/8), little dark yellowish brown (10 YR 4/6) CLAY; little silt, trace fine sand; low plasticity, stiff, dry.		24-28	100	9/12	
-25							16/12	
-26							20/12	
-27							27/12	
-28			CL-ML: Mottled dark yellowish brown (10 YR 4/6) and light bluish gray (Gley 2 7/1) CLAY and SILT; little fine sand, trace black (10 YR 2/1) organics; stiff, low-medium plasticity, dry.				12/12	
-29			CL-ML: Yellowish brown (10 YR 5/8) CLAY and SILT; trace fine sand, trace black (10 YR 2/1) organics; low to medium plasticity, dry.		28-32	100	19/12	
-30							34/12	
-31			SP: Very pale brown (10 YR 7/4) fine SAND; very moist.				41/12	
-32			CL-ML: Yellow (10 YR 7/8) and yellowish brown (10 YR 5/8), little black (10 YR 2/1) CLAY and SILT; stiff, low plasticity; little fine sand. Dry.		32-36	67	20/12	
-33			CL: Yellow (10 YR 7/8) and yellowish brown (10 YR 5/8), little black (10 YR 2/1) CLAY; some fine sand, little silt; medium plasticity, fairly stiff, dry.				41/12	
-34			CL: Strong brown (7.5 YR 5/8 4/6) CLAY; some silt, little black (10 YR 2/1) organics; low plasticity, stiff. Dry.				61/12	
-35			SC: Strong brown (7.5 YR 5/8) to brown (7.5 YR 4/4) CLAY and fine SAND; slightly moist.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-16B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-36			CL: Strong brown (7.5 YR 5/8) and yellowish red (5 YR 5/8) CLAY; little silt, little fine sand; fairly stiff, low plasticity, moist.		36-40	88	45/12 14/12	
-37			SW: Strong brown (7.5 YR 5/6) fine SAND; trace silt, wet.				29/12	
-38							37/12	
-39							36/12	
-40			SW: Strong brown (7.5 YR 5/6) fine to coarse SAND; trace silt, loose; wet.		40-44	88	17/12	
-41							29/12	
-42			SM: Strong brown (7.5 YR 5/6) SILT and fine SAND; very moist.				35/12	
-43			SM: Strong brown (7.5 YR 5/6) fine SAND; some silt, little clay; wet.				53/12	
-44			SM: Strong brown (7.5 YR 5/6) fine SAND; some silt, wet.		44-48	83	37/12	
-45			SM: Very dark gray (10 YR 3/1) to olive brown (2.5 Y 4/3) fine to coarse SAND; some red (2.5 YR 4/8) silt; wet.				28/12	
-46			CL-ML: Olive yellow (2.5 Y 6/6), yellow (2.5 Y 7/6) and black (10 YR 2/1) SILT and CLAY; some mottling, stiff, low plasticity, dry.				26/12	
-47							27/12	
-48			CL-ML: Olive yellow (2.5 Y 6/6) and yellowish brown (10 YR 5/6) CLAY and SILT; very stiff, low plasticity; dry.		48-52	83	15/12	
-49			SW: Brown (7.5 YR 4/3) fine SAND.				22/12	
-50			ML: Mottled olive yellow (2.5 Y 6/6), strong brown (7.5 YR 5/6) and brownish yellow (10 YR 6/6) SILT; some clay, stiff.				78/12	
-51			GM: Yellow (10 YR 7/6) and very pale brown (10 YR 7/4) SILT; some fine gravel, stiff; slightly moist.				32/12	CARBONATE ZONE
-52			GP: Very pale brown (10 YR 7/4) coarse GRAVEL; some coarse sand; trace silt; wet.				18/12	
-53			GM: Very pale brown (10 YR 7/4) coarse GRAVEL, coarse SAND, and SILT; wet.		52-56	100	32/12	
-54			ML: Pale yellow (2.5Y 8/4) SILT; fairly soft, moist.				100/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-16B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-55								
-56			ML: Pale yellow (2.5Y 8/4) and very pale brown (10 YR 7/4) SILT; little fine gravel, stiff, mostly dry.		56-58	100	75/12	
-57			ML: Light greenish gray (Gley 1 7/1) SILT; little fine gravel, very stiff; dry.				100/12	
-58			END OF SAMPLING					
-59								
-60								
-61								
-62								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-17A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 12/6/2007

Date Completed: 12/6/2007

Depth of Hole (ft): 46.00

Boring/Well: MONITORING WELL

Elevation (ft): 15.92

Northing (m): 868669.72

Easting (m): 763170.59

UTM NAD83

Gauged Depth to Water (ft): 7.32

Conditions: Asphalt

Comments: Buchanan, in commissary lot

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			NS: No lithology collected					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
-35								
-36								
-37			ML: Striated yellowish brown (10 YR 5/8), brownish yellow (10 YR 6/6), and very dark grayish brown (10 YR 4/2) SILT; trace clay; slightly moist.		36-40	81	19/12	
-38			ML: Very pale brown (10 YR 7/4) SILT; little fine gravel and coarse sand; moist.				21/12	
-39			ML: Yellowish brown (10 YR 5/8) SILT; little clay, trace coarse sand; fairly stiff, slightly moist.		40-44	75	42/12	
-40			ML: Striated yellowish brown (10 YR 5/8) and dark grayish brown (10 YR 4/2) SILT; trace coarse gravel, moist.				45/12	
-41			GM: Very pale brown (10 YR 7/4) coarse SAND, SILT, and fine GRAVEL; very moist.				13/12	
-42			CL-ML: Striated yellowish brown (10 YR 5/8), brownish yellow (10 YR 6/6), and dark yellowish brown (10 YR 4/4) SILT and CLAY; more silty at depth; trace coarse sand. Moist.				44/12	
-43							26/12	
-44							26/12	
-45								
-46			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-17B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 12/4/2007

Date Completed: 12/5/2007

Depth of Hole (ft): 65.00

Boring/Well: BOREHOLE

Elevation (ft):

Northing (m): 0

Easting (m): 0

UTM NAD83

Gauged Depth to Water (ft): NA

Conditions: Asphalt

Comments: Buchanan, in Commissary lot

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			GW: Asphalt underlain with coarse bluish gray (Gley 2 6/1) GRAVEL. Dry.		0-4	79	44/12	
-1			CL-ML: Dark yellowish brown (10 YR 3/6) SILT and CLAY; low plasticity, stiff, dry.				19/12	
-2							24/12	
-3							25/12	
-4			CL-ML: Yellowish brown (10 YR 5/6) SILT and CLAY; striations of yellowish red (5 YR 4/6) silt and white (10 YR 8/1) clay; trace fine gravel, trace black (10 YR 2/1) organics; fairly stiff, low plasticity, dry.		4-8	79	5/12	
-5							9/12	
-6							19/12	
-7							20/12	
-8			CL-ML: Striated white (10 YR 8/1) CLAY and dark red (7.5 YR 3/6) SILT; some yellowish brown (10 YR 5/8) striations; stiff, dry.		8-12	100	10/12	
-9							19/12	
-10							30/12	
-11							36/12	
-12			CL-ML: Striated white (10 YR 8/1) CLAY and dark red (7.5 YR 3/6) SILT; little yellowish brown (10 YR 5/8) silt and clay; trace pale red (10 R 6/4) clay; low to medium plasticity of clays; some wet seams, remainder dry.		12-16	100	18/12	
-13							47/12	
-14							61/12	
-15							52/12	
-16			CL-ML: Striated white (10 YR 8/1) CLAY and yellowish brown (10 YR 5/8) and dark red (7.5 YR 3/6) SILT; lenses (trace) of fine to coarse sand; trace black organics; stiff, low plasticity, dry (wet in sand lenses).		16-20	100	19/12	
-17							40/12	
-18							39/12	
-19							56/12	
-20			CL-ML: Striations of white (10 YR 8/1) and strong brown (7.5 YR 4/6) CLAY and SILT; some yellowish brown (10 YR 5/8) silt; trace fine sand, trace black (10 YR 2/1) organics; stiff, dry.		20-24	100	23/12	
-21							37/12	
-22							44/12	



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-17B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-23							46/12	
-24			ML: Strong brown (7.5 YR 4/6) and/or yellowish red (5 YR 4/6) SILT; some clay, little yellowish brown (10 YR 5/8) silt, stiff, low plasticity, mostly dry with some wet seams.		24-28	83	25/12	
-25							60/12	
-26							67/12	
-27							56/12	
-28			ML: Yellowish red (5 YR 4/6) SILT; some clay; low plasticity, stiff, slightly moist.		28-32	100	47/12	
-29							57/12	
-30							87/12	
-31							82/12	
-32			CL-ML: Mottled yellowish brown (10 YR 5/8) SILT and CLAY with black (10 YR 2/1) organics; stiff, dry. ML: Yellowish red (5 YR 4/6) SILT; some clay, little fine sand at top of interval; stiff, low plasticity, mostly dry.		32-36	100	21/12	
-33							45/12	
-34							66/12	
-35							48/12	
-36			CL-ML: Striated very pale brown (10 YR 7/4), grayish brown (10 YR 5/2) and yellowish brown (10 YR 5/6) SILT and CLAY; fairly stiff, mostly dry. ML: Striated very pale brown (10 YR 7/4), grayish brown (10 YR 5/2), yellowish brown (10 YR 5/6) to dark yellowish brown (10 YR 4/4) SILT; little clay, little black (10 YR 2/1) silt; fairly stiff, mostly dry.		36-40	100	15/12	
-37							21/12	
-38							61/12	CARBONATE ZONE
-39							100/12	
-40			GM: Very pale brown (10 YR 7/4) coarse GRAVEL and coarse SAND; some dark yellowish brown (10 YR 4/4) silt; wet.		40-44	83	46/12	
-41							39/12	
-42							18/12	
-43							16/12	
-44			ML: Striated yellowish brown (10 YR 5/8) and very pale brown (10 YR 7/3) SILT; stiff, mostly dry.		44-48	100	22/12	
-45							35/12	
-46							46/12	
-47							60/12	
-48			ML: Greenish gray (Gley 1 6/1) SILT; trace white (10 YR 8/1) fine gravel at depth; very stiff, dry.		48-52	100	29/12	
-49							46/12	
-50								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-17B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-51			ML: Greenish gray (Gley 1 6/1) SILT; some fine white (10 YR 8/1) gravel (shells?); trace clay, very stiff, dry.				75/12	
-52			ML: Greenish gray (Gley 1 6/1) SILT; some fine white (10 YR 8/1) gravel (shells?) stiff, mostly dry.		52-56	100	68/12	
-53			ML: Greenish gray (Gley 1 6/1), some light greenish gray (Gley 1 8/1) SILT; trace to little dark yellowish brown (10 YR 4/4) silt, trace fine gravel; stiff, mostly dry.				49/12	
-54							65/12	
-55							100/12	
-56			GM: Light greenish gray (Gley 1 8/1) SILT and fine white (10 YR 8/1) GRAVEL (shells); little clay, little coarse sand; slightly moist.		56-58	100	100/12	
-57								
-58			ML: Striated bluish gray (Gley 2 6/1) and yellowish brown (10 YR 5/8) SILT; some fine gravel, dry.		58-60	100	43/12	
-59			ML: Bluish gray (Gley 2 6/1) SILT; some dark yellowish brown (10 YR 4/4) silt, stiff, dry.				57/12	
-60			SM: Bluish gray (Gley 2 6/1) SILT and coarse SAND; dense/stiff; slightly moist.		60-62	94	35/12	
-61			SM: Bluish gray (Gley 2 6/1) SILT and coarse SAND (shell fragments); dense, moist.				100/12	
-62			OL: Bluish gray (Gley 2 6/1) and black (10 YR 2/1) SILT; some coarse sand, moist.					
-63			ML: Dark bluish gray (Gley 2 4/1) SILT; some coarse sand, moist.		63-65	68	73/12	
-64							100/12	
-65			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-18A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 12/17/2007

Date Completed: 12/17/2007

Depth of Hole (ft): 45.00

Boring/Well: MONITORING WELL

Elevation (ft): 19.45

Northing (m): 868072.43

Easting (m): 763428.87

UTM NAD83

Gauged Depth to Water (ft): 13.85

Conditions: Asphalt

Comments: Buchanan, in Army Reserve parking lot

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			NS: No lithology collected					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
-35								
-36	☒	☒	GM: Very pale brown (10 YR 7/4) coarse GRAVEL; some fine gravel and coarse sand, some silt; dense, wet.		35-39	100	58/12	
-37	☒	☒	GM: Yellow (10 YR 7/6) and very pale brown (10 YR 7/3) fine to coarse GRAVEL and SILT; little coarse sand, dense; very moist.				78/12	
-38	☒	☒					100/12	
-39	☒	☒						
-40	☒	☒						
-41	☒	☒	GM: Yellow (10 YR 7/6) to brownish yellow (10 YR 6/8) SILT; and fine white (10 YR 8/1) GRAVEL; little coarse sand; dense, very moist.		40-44	100	21/12	
-42	☒	☒					100/12	
-43	☒	☒	GP: Very pale brown (10 YR 7/4) fine GRAVEL; some coarse gravel, little coarse sand; little silt. Wet.					
-44	☒	☒						
-45			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-18B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 12/13/2007

Date Completed: 12/17/2007

Depth of Hole (ft): 62.00

Boring/Well: MONITORING WELL

Elevation (ft): 19.57

Northing (m): 868070.5

Easting (m): 763439.44

UTM NAD83

Gauged Depth to Water (ft): 13.99

Conditions: Asphalt

Comments: Buchanan, in Army Reserve Lot

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Asphalt (FILL)		0-4	69	45/12	
-1			GM: Yellowish brown (10 YR 5/8) SILT and coarse white (10 YR 8/1) GRAVEL; dense, dry.				10/12	
-2			CL-ML: Gray (10 YR 6/1) and red (2.5 YR 4/6), trace yellowish brown (10 YR 5/8) CLAY and SILT; stiff, low plasticity, dry.				20/12	
-3							26/12	
-4			ML: Gray (10 YR 6/1) and red (2.5 YR 4/6) SILT; some clay, little fine sand, stiff; dry.		4-8	100	16/12	
-5							26/12	
-6			ML: Yellowish brown (10 YR 5/8) SILT; little medium sand, trace gray (10 YR 6/1) clay; stiff, dry.				38/12	
-7							38/12	
-8			ML: Mottled yellowish brown (10 YR 5/8) and gray (10 YR 6/1) SILT, some clay; to gray and red (2.5 YR 4/6) mottled SILT, some clay; low plasticity, stiff; mostly dry.		8-12	100	17/12	
-9							35/12	
-10							41/12	
-11							38/12	
-12			CL-ML: Gray (10 YR 6/1) SILT and CLAY; little dark red (2.5 YR 3/6) silt; trace fine sand, fairly soft; low-medium plasticity. Dry.		12-16	100	10/12	
-13			OL: Mottled gray (10 YR 6/1), yellowish brown (10 YR 5/8), trace red (2.5 YR 4/6) and trace black (10 YR 2/1) SILT; some fine sand, trace clay. Dry.				16/12	
-14							23/12	
-15							38/12	
-16			CL-ML: Gray (10 YR 6/1) and yellowish brown (10 YR 5/8) SILT and CLAY; stiff, low plasticity, dry.		16-20	100	9/12	
-17			OL: Gray (10 YR 6/1) and yellowish brown (10 YR 5/8) SILT; little to some clay, trace organics, trace fine sand; fairly soft; dry to slightly moist; becoming yellowish brown and light greenish gray (Gley 1 7/1) at depth.				15/12	
-18							23/12	
-19								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-18B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name			
				VOC (ppm)							
-20			OL: Light greenish gray (Gley 1 7/1) and yellowish brown (10 YR 5/8) SILT; little clay; trace black (10 YR 2/1) organics, trace white (10 YR 8/1) silt; stiff, dry.		20-24	100	28/12	CARBONATE ZONE			
-21							14/12				
-22							24/12				
-23							31/12				
-24							39/12				
-24			OL: Light greenish gray (Gley 1 7/1) SILT; trace black organics, trace clay. Dry.		24-28	100	13/12				
-25			GM: Light greenish gray (Gley 1 7/1) fine to fine to coarse GRAVEL and SILT; trace yellowish brown (10 YR 5/8) silt, trace clay; stiff/dense, slightly moist.				33/12				
-26							34/12				
-27							47/12				
-28			ML: Light greenish gray (Gley 1 7/1) SILT; some to little fine to coarse gravel, medium stiffness; dry.				28-32		100	21/12	
-29				100/12							
-30				GM: Light greenish gray (Gley 1 7/1) SILT and fine white (10 YR 8/1) GRAVEL; stiff/dense, mostly dry.	32-36	100				100/12	
-31											
-32											
-33			GP: Very pale brown (10 YR 7/4) coarse GRAVEL; some fine gravel, wet.		36-40	100	40/12				
-34							65/12				
-35							100/12				
-36							ML: Yellow (10 YR 7/6) SILT; little to some (at depth) coarse sand; little fine gravel; dense, very moist.		40-44	100	66/12
-37											GM: Very pale brown (10 YR 7/4) fine GRAVEL and SILT; wet.
-38											
-39			ML: Yellow (10 YR 7/6) to brownish yellow (10 YR 6/8) SILT; little fine gravel, moist.		40-44	100	66/12				
-40							GM: Very pale brown (10 YR 7/4) coarse GRAVEL and SILT; little coarse sand, wet.		100/12		
-41											
-42			GM: Very pale brown (10 YR 7/4) coarse GRAVEL and SILT; little coarse sand, wet.		40-44	100	66/12				



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-18B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-43								
-44			GM: Very pale brown (10 YR 7/4) fine GRAVEL and SILT; some coarse sand, trace clay; dense, very moist to wet.		44-48	100	100/12	
-45								
-46								
-47								
-48			ML: Greenish gray (Gley 1 6/1) SILT; some fine sand, stiff; slightly moist.		48-52	100	28/12	
-49			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; little clay; stiff; dry.				56/12	
-50							67/12	
-51							75/12	
-52			ML: Yellowish red (5 YR 4/6), greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; stiff, dry.		52-56	75	30/12	
-53							51/12	
-54			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; little to trace white (10 YR 8/1) silt, trace fine gravel; stiff, dry.				55/12	
-55							94/12	
-56			ML: Greenish gray (Gley 1 6/1) SILT; some very pale brown (10 YR 7/4) fine gravel; little yellowish brown (10 YR 5/8) silt; very moist.		56-58	100	100/12	
-57								
-58			GM: Greenish gray (Gley 1 6/1) little very pale brown (10 YR 7/4) fine GRAVEL, SILT, and coarse SAND; very moist to wet.		58-60	100	100/12	
-59								
-60			ML: Bluish gray (Gley 2 6/1) and yellowish brown (10 YR 5/8) SILT; trace fine gravel, very stiff; mostly dry.		60-62	100	75/12	
-61							100/12	
-62			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-19A**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 2', 150 LB HAMMER

Drill Type: HSA

Date Started: 11/28/2007

Date Completed: 11/29/2007

Depth of Hole (ft): 38.00

Boring/Well: MONITORING WELL

Elevation (ft): 28.31

Northing (m): 867330.27

Easting (m): 763313.61

UTM NAD83

Gauged Depth to Water (ft): 4.55

Conditions: Grass

Comments: Buchanan, near Lake

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			NS: No lithology collected					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31			CL: Mottled greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/6), little red (2.5 YR 4/6) CLAY; trace fine white (10 YR 8/1) gravel; stiff, moist.		30-32	92	30/12 100/12	CARBONATE ZONE
-32			GM: Very pale brown (10 YR 7/4) coarse SAND and fine GRAVEL; some silt, trace clay; very moist to wet.					
-33			GP: Very pale brown (10 YR 7/4) coarse SAND and fine to coarse GRAVEL; little silt, wet.		33-35	100	29/12 100/12	
-34								
-35								
-36			GM: Yellowish brown (10 YR 5/6) and very pale brown (10 YR 7/4) coarse SAND, coarse GRAVEL, and SILT; dense, very moist.		36-38	100	74/12 52/12	
-37			CL-ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/6) CLAY and SILT; stiff, low plasticity, dry.					
-38			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-19B**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 11/27/2007

Date Completed: 11/28/2007

Depth of Hole (ft): 64.00

Boring/Well: MONITORING WELL

Elevation (ft): 28.25

Northing (m): 867329.04

Easting (m): 763325.48

UTM NAD83

Gauged Depth to Water (ft): 4.31

Conditions: Grass

Comments: Buchanan, near Lake

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			CL-ML: Dark brown (10 YR 3/3) CLAY and SILT (organics); trace coarse gravel.		0-4'	58	13/12	
-1			CL: Yellowish brown (10 YR 5/6) CLAY; some silt, little medium sand; trace organics, trace white (10 YR 8/1) clay. Dry.				9/12	
-2			OH: Very dark grayish brown (10 YR 3/2) CLAY; highly plastic; some silt, little fine to coarse sand; little coarse gravel; moist.				18/12	
-3							13/12	
-4			OH: Yellowish brown (10 YR 5/6) and dark bluish gray (Gley 2 4/1) to bluish gray (Gley 2 5/1) CLAY; highly plastic, soft; little fine sand, little organic matter. Moist.		4-8	63	13/12	
-5							8/12	
-6			SW: Light brownish gray (10 YR 6/2) medium SAND; wet.				11/12	
-7			CL: Yellowish brown (10 YR 5/6) and bluish gray (Gley 2 5/1) CLAY; soft, highly plastic; moist.				13/12	
-8			CL: Very dark grayish brown (10 YR 3/2) CLAY; trace fine sand, moist.		8-12	83	3/12	
-9			SW: Light brownish gray (10 YR 6/2) fine SAND; wet.				8/12	
-10			OH: Yellowish brown (10 YR 5/6) and bluish gray (Gley 2 5/1) CLAY; soft, highly plastic; trace fine sand and organics.				10/12	
-11			OH: Black (10 YR 2/1) CLAY; soft, highly plastic, moist.				13/12	
-12			OH: Yellowish brown (10 YR 5/6) and bluish gray (Gley 2 5/1) CLAY; some silt, some fine sand; trace organics; fairly soft, medium plasticity, very moist.		12-16	42	8/12	
-13							11/12	
-14							15/12	
-15							13/12	
-16			SC-SM: Yellowish brown (10 YR 5/6), trace light gray (10 YR 7/1) CLAY, SILT, and fine SAND; soft, very moist.		16-20	100	7/12	
-17								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-19B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-18			SM: Yellowish brown (10 YR 5/6) SILT and fine SAND; very soft, loose; wet.				10/12	
-19			CL-ML: Yellowish brown (10 YR 5/6) to red (2.5 YR 4/6) with mottles of light gray (10 YR 7/1) CLAY and SILT; stiff, medium plasticity; fairly dry.				12/12	
-20			CL-ML: Red (2.5 YR 4/6), bluish gray (Gley 2 5/1), and yellowish brown (10 YR 5/6) mottled CLAY and SILT; little to some fine sand, trace fine gravel; trace weak red (purplish) (10 R 5/2) clay; fairly stiff, low plasticity; moist.		20-24	67	10/12	
-21							17/12	
-22							19/12	
-23							24/12	
-24			CL: Striated/mottled red (2.5 YR 4/6), bluish gray (Gley 2 5/1), and yellowish brown (10 YR 5/6) CLAY; some silt; trace fine sand; stiff, medium plasticity. Moist.		24-28	100	10/12	
-25			SM: Yellowish brown (10 YR 5/6), some light gray (10 YR 7/2) fine SAND and SILT; some clay, moist to wet.				28/12	
-26			CL-ML: Light gray (10 YR 7/2) and yellowish brown (10 YR 5/6) CLAY and SILT; stiff, low plasticity; slightly moist.				10/12	
-27			SM: Yellowish brown (10 YR 5/6) and light gray (10 YR 7/2) fine SAND, some silt; moist.				20/12	
-28			CL-ML: Yellowish brown (10 YR 5/6), light gray (10 YR 7/2), and red (2.5 YR 4/6) CLAY and SILT; trace fine sand, stiff; low plasticity, slightly moist.				23/12	
-29			CL-ML: Red (2.5 YR 4/6), light gray (10 YR 7/2) and yellowish brown (10 YR 5/6) CLAY and SILT; trace black (10 YR 2/1) organics, trace fine sand; stiff, low-medium plasticity; mostly dry.		28-32	100	6/12	
-30							18/12	
-31							24/12	
-32							34/12	
-33			OH: Mottled red (2.5 YR 4/6), bluish gray (Gley 2 5/1), yellowish brown (10 YR 5/6) and black (10 YR 2/1) CLAY; trace coarse sand; stiff, medium plasticity. Dry.		32-34	100	15/12	
-34			GM: Very pale brown (10 YR 7/4 8/3) coarse SAND, fine GRAVEL, and SILT; moist.				100/12	CARBONATE ZONE
-35			GP: Light gray (10 YR 7/2) and very pale brown (10 YR 7/4) coarse SAND, fine to coarse GRAVEL, and SILT; little clay; dense, moist to wet.		34-38	100		
-36							100/12	
-37								
-38								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-19B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-38			GW: Very pale brown (10 YR 7/4) coarse GRAVEL; wet.		38-42	100	13/12	
-39			ML: Yellowish brown (10 YR 5/6) and gray (10 YR 6/1) SILT; fairly stiff, mostly dry.				31/12	
-40			ML: Brownish yellow (10 YR 6/6) SILT; some fine gravel and coarse sand; slightly moist.				62/12	
-41			GM: Brownish yellow (10 YR 6/6) SILT and very pale brown (10 YR 7/4) fine to coarse GRAVEL; dense, moist.				100/12	
-42			GP: Very pale brown (10 YR 7/4) fine to coarse GRAVEL; some coarse sand, little silt; wet.		42-44	100	100/12	
-43								
-44			GP: Yellow (10 YR 7/6) and very pale brown (10 YR 7/4) fine to coarse GRAVEL and coarse SAND; little silt, trace dark reddish brown (5 YR 3/4) gravel. Wet.		44-46	100	81/12	
-45							100/12	
-46			GP: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) coarse SAND and fine to coarse GRAVEL; trace silt, wet.		46-48	100	100/12	
-47								
-48			SW: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) coarse SAND; some fine to coarse gravel, trace silt. Wet.		48-50	100	89/12	
-49							100/12	
-50			GP: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) coarse SAND and fine GRAVEL; little to trace silt. Wet.		50-52	100	100/12	
-51								
-52			GP: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) coarse SAND and fine GRAVEL; trace silt, wet.		52-54	100	100/12	
-53								
-54			GP: Very pale brown (10 YR 7/4) coarse GRAVEL; some coarse sand, little silt. Wet.		54-56	100	100/12	
-55								
-56			GP: Very pale brown (10 YR 7/4) coarse GRAVEL; little coarse sand, wet.		56-58	100	64/12	
-57			SM: Very pale brown (10 YR 7/3, 7/4) fine SAND and SILT; wet.				100/12	
-58			SM: Very pale brown (10 YR 7/4) fine SAND; some silt, wet.		58-60	100	100/12	
-59								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-19B

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-60			SM: Very pale brown (10 YR 7/4) fine SAND and SILT; little fine gravel, very moist.		60-62	100	100/12	
-61								
-62			GP: Very pale brown (10 YR 7/4) coarse GRAVEL; some coarse sand, little silt; very moist.		62-64	100	80/12	
-63			ML: Dark yellowish brown (10 YR 4/6) SILT; little to trace fine sand, slightly moist.				100/12	
-64			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-20**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/22/2008

Date Completed: 4/23/2008

Depth of Hole (ft): 51.00

Boring/Well: MONITORING WELL

Elevation (ft): 23.90

Northing (m): 867822.8646

Easting (m): 762620.3149

UTM NAD83

Gauged Depth to Water (ft): 14.25

Conditions: Grass in enclosed area

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: FILL					
-1								
-2								
-3								
-4			UNKNOWN: No Recovery		4-8	0	9/12	
-5							9/12	
-6							8/12	
-7							11/12	
-8			CL: Light bluish gray (Gley 2 7/1) to bluish gray (Gley 2 6/1) CLAY; little silt; high plasticity, soft. Mostly dry.		8-12	100	6/12	
-9							10/12	
-10			CL: Yellowish brown (10 YR 5/8) with mottles of gray (10 YR 6/1) and light bluish gray (Gley 2 7/1) CLAY; some silt, trace coarse sand; medium plasticity, soft; slightly moist.				17/12	
-11							20/12	
-12			CL: Light bluish gray (Gley 2 7/1) and yellowish brown (10 YR 5/8) CLAY; little silt, trace medium sand; medium plasticity, medium stiff. Dry.		12-16	100	9/12	
-13							15/12	
-14							25/12	
-15							33/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-20

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-16			CL: Brownish yellow (10 YR 6/8), some light bluish gray (Gley 2 7/1) CLAY; some silt, stiff; little black silt and fine gravel; low to medium plasticity. Dry.		16-20	100	10/12	
-17							20/12	
-18							26/12	
-19							33/12	
-20			CL: Strong brown (7.5 YR 4/6) trace light bluish gray (Gley 2 7/1) CLAY; some silt, little black fine gravel (iron?); stiff, medium plasticity.		20-24	100	14/12	
-21							18/12	
-22			SC: Strong brown (7.5 YR 4/6) CLAY and fine SAND; soft, moist.				23/12	
-23							18/12	
-24			CL-ML: Strong brown (7.5 YR 4/6) CLAY and SILT; trace medium sand; soft, moist.		24-28	81	8/12	
-25			CL: Strong brown (7.5 YR 4/6) CLAY; little fine sand, soft; medium plasticity, moist.				16/12	
-26			CL: Strong brown (7.5 YR 4/6) CLAY; some silt, trace fine white gravel; stiff, low to medium plasticity, trace light bluish gray (Gley 2 7/1) clay, slightly moist.				21/12	
-27							23/12	
-28			CL-ML: Strong brown (7.5 YR 4/6) CLAY and SILT; soft; medium plasticity; moist; black fine gravel at 10".		28-32	100	9/12	
-29							15/12	
-30			CL: Strong brown (7.5 YR 4/6) CLAY; some fine to medium sand; very moist.				19/12	
-31			CL: Strong brown (7.5 YR 4/6) CLAY; some silt, stiff; medium plasticity, moist.				25/12	
-32			SC: Strong brown (7.5 YR 4/6) fine SAND; some clay, loose; wet.		32-36	83	7/12	
-33			CL: Yellowish brown (10 YR 5/4) CLAY; trace silt and fine sand; medium plasticity, soft, moist.				12/12	
-34			SC: Yellowish brown (10 YR 5/4) fine to medium SAND and CLAY; soft, very moist to wet.				17/12	
-35			CL-ML: Pale brown (10 YR 6/3) CLAY and SILT; trace light bluish gray (Gley 2 7/1) clay, stiff; medium plasticity, slightly moist.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-20

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
36							23/12	
-36			SC: Pale brown (7.5 YR 4/6) CLAY and fine SAND; some silt; little light bluish gray (Gley 2 7/1) clay; medium stiff, medium dense; very moist.		36-40	83	8/12	
-37							19/12	
-38			CL-ML: Strong brown (7.5 YR 4/6) and yellowish brown (10 YR 5/4) CLAY and SILT; trace fine round black gravel (iron?); trace white fine gravel; stiff, low plasticity, fairly dry.				32/12	
-39							49/12	
-40			CL-ML: Pale brown (10 YR 6/3) CLAY and SILT; little fine gravel, low plasticity; moist.		40-43	100	15/12	
-41			CL: Mottled light bluish gray (Gley 2 7/1), yellowish brown (10 YR 5/8) and pale brown (10 YR 6/3) CLAY; little silt; trace medium gravel, stiff, low plasticity. Slightly moist.				35/12	
-42			SW: Light bluish gray (Gley 2 7/1) medium SAND; loose, wet.				105/12	BEGIN CARBONATE ZONE
-43			GC-GM: Mottled yellowish brown (10 YR 5/8), light greenish gray (Gley 2 7/1) CLAY, SILT, and fine GRAVEL; becoming very pale brown (10 YR 8/2) SILT and fine GRAVEL; dense/stiff, moist.					
-43			SW: Very pale brown (10 YR 8/2) coarse SAND and medium GRAVEL; loose, wet.		43-45	100	100/12	
-44			GW: Very pale brown (10 YR 8/2) coarse SAND and fine GRAVEL; little silt, dense; wet.					
-45			GP: Very pale brown (10 YR 8/2) coarse SAND and fine GRAVEL; little silt, dense, wet.		45-47	100	100/11	
-46								
-47			GP-GM: Very pale brown (10 YR 8/2) coarse SAND and medium GRAVEL; some silt, dense, wet.		47-49	100	56/12	
-48			GW: Very pale brown (10 YR 7/4) medium GRAVEL; little coarse sand, trace silt; wet.				87/6	
-48			GM: Very pale brown (10 YR 8/2) fine GRAVEL and SILT; some coarse sand, dense; moist.					
-49			ML: Light greenish gray (Gley 1 7/1) and yellowish brown (10 YR 5/8) SILT; little fine gravel; stiff, slightly moist.		49-51	100	70/12	
-50							100/5	
-51			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-21

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 4/15/2008

Date Completed: 4/15/2008

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 25.12

Northing (m): 867660.5503

Easting (m): 762681.5519

UTM NAD83

Gauged Depth to Water (ft): 11.7

Conditions: Grass

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			OL: Dark yellowish brown (10 YR 3/6) CLAY and SILT; little coarse sand, low plasticity, dry.		0-4	0.8	6/12	
-1							13/12	
-2							14/12	
-3							14/12	
-4			GW: Coarse GRAVEL; dry.		4-8	50	4/12	
-5			OH: Gray (10 YR 5/1) and brown (10 YR 4/3) CLAY; soft; some silt and organics; highly plastic; dry.				7/12	
-6							11/12	
-7							11/12	
-8			CL: Mottled gray (10 YR 5/1), brown (10 YR 4/3), light bluish gray (Gley 2 7/1) CLAY; some silt; soft, highly plastic, dry.		8-12	100	3/12	
-9							5/12	
-10							9/12	
-11							16/12	
-12			CL-ML: Gray (10 YR 5/1) and brown (10 YR 4/3) CLAY and SILT; soft, highly plastic; very moist.		12-16	100	6/12	
-13			CL: Mottled gray (10 YR 5/1) and brown (10 YR 4/3) CLAY; soft, little silt; trace fine to medium sand, mostly dry.				9/12	
-14			CL: Yellowish brown (10 YR 5/6) and light bluish gray (Gley 2 7/1) CLAY; little silt, trace-little fine sand; soft, medium plasticity; slightly moist.				17/12	
-15			SW: Light bluish gray (Gley 2 7/1) medium SAND; little silt; wet.				21/12	
-16			CL-ML: Yellowish brown (10 YR 5/6) and bluish gray (Gley 2 6/1) CLAY and SILT; little sand, fairly soft, slightly moist.		16-20	100	9/12	
-17			OH: Mottled light bluish gray (Gley 2 7/1) and yellowish brown (10 YR 5/6) CLAY; some strong brown (7.5 YR 4/6) and black silt; stiff, medium plasticity, mostly dry.				17/12	
-18							23/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-21

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-19							24/12	
-20			OH: Strong brown (7.5 YR 5/8) with light bluish gray (Gley 2 7/1) mottles CLAY; some silt, medium plasticity; various wet seams; mostly dry, little black (iron) fine gravel at depth.		20-24	100	10/12	
-21							11/12	
-22							16/12	
-23							16/12	
-24			CL: Strong brown (7.5 YR 5/8) CLAY; little bluish gray (Gley 2 6/1) mottles; little silt; medium plasticity, soft; little fine sand at 20", mostly dry/slightly moist.		24-28	100	6/12	
-25							10/12	
-26							14/12	
-27							19/12	
-28			SW: Brownish yellow (10 YR 6/8) to gray (10 YR 5/1) fine to medium SAND; some silt, very moist. CL: Strong brown (7.5 YR 5/8) CLAY; soft, slightly moist.		28-32	100	8/12	
-29			GM: Very pale brown (10 YR 7/4), strong brown (7.5 YR 5/8) and brownish yellow (10 YR 6/8) fine GRAVEL; medium SAND, and SILT; little caly, very moist.				13/12	CARBONATES
-30							21/12	
-31							50/5	
-32			SM: Very pale brown (10 YR 7/3), light gray (10 YR 7/2) and brownish yellow (10 YR 6/8) fine SAND; some silt, trace fine white gravel, very moist.		32-36	100	20/12	
-33							223/12	
-34			ML: Very pale brown (10 YR 7/4) and strong brown (7.5 YR 5/8) SILT; little clay, little fine sand, trace white gravel at depth; slightly moist, dense.				34/12	
-35							43/12	
-36			CL-ML: Striated light greenish gray (Gley 1 7/1), strong brown (7.5 YR 5/8) and grayish green (Gley 1 4/2) CLAY and SILT; little fine sand, fairly stiff; mostly dry.		36-40	100	15/12	
-37			GM: Light greenish gray (Gley 1 7/1) SILT and very pale brown (10 YR 7/4) to white fien GRAVEL; some medium sand, dense, moist.				50/6	
-38								
-39								
-40			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-22**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/16/2008

Date Completed: 4/17/2008

Depth of Hole (ft): 50.00

Boring/Well: MONITORING WELL

Elevation (ft): 22.41

Northing (m): 867935.4267

Easting (m): 763032.7310

UTM NAD83

Gauged Depth to Water (ft): 9.21

Conditions: Grass

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Strong brown (7.5 YR 5/6) to light brown (7.5 YR 6/4) mottled CLAY (FILL); gravel at 1', wood pieces at depth.		0-4	50	9/12	
-1							13/12	
-2							6/12	
-3							9/12	
-4			CL: Strong brown (7.5 YR 5/6) CLAY; little silt; stiff, dry.		4-8	61	4/12	
-5			SC-SM: Dark greenish gray (Gley 2 4/1) CLAY, SILT, and fine SAND; moistening at depth, soft.				6/12	
-6			CL: Light bluish gray (Gley 2 7/1) and strong brown (7.5 YR 5/6) CLAY; soft, little fine sand, trace silt. Slightly moist.				7/12	
-7			SW: Brown (10 YR 5/3) fine SAND; little silt, moist.				7/12	
-8			CL: Light bluish gray CLAY; soft, medium plasticity, dry.					
-9			OH: Dark bluish gray (Gley 2 4/1) CLAY; little strong brown (7.5 YR 5/6) striations; organics; little silt, medium plasticity, soft; dry.		8-12	67	4/12	
-10			SW: Light bluish gray (Gley 2 7/1) fine SAND; little clay, very moist.				8/12	
-11			OH: Bluish gray (Gley 2 6/1) to dark bluish gray (Gley 2 4/1) CLAY; soft, high plasticity; little silt; dry.				10/12	
-12			SM: Bluish gray (Gley 2 6/1) SILT and fine SAND; soft, loose; very moist.		12-16	61	4/12	
-13			SW: Bluish gray (Gley 2 6/1) and gray (10 YR 6/1) fine to medium SAND; little to trace silt, loose, wet.				8/12	
-14							10/12	
-15							16/12	
-16			OH: Light bluish gray (Gley 2 7/1) CLAY; soft, medium plasticity; little fine sand, moist.		16-20	80	3/12	
-17							6/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-22

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-18			CL: Brownish yellow (10 YR 6/8) mottled red (2.5 YR 4/8), bluish gray (Gley 2 5/1) CLAY; little medium sand; medium to low plasticity, stiffening; moist.				17/12	
-19							25/12	
-20			CL: Mottled light bluish gray (Gley 2 7/1) yellowish red (5 YR 5/8) and strong brown (7.5 YR 5/6) CLAY; stiffening; some silt, little medium sand, low to medium plasticity, slightly moist.		20-24	83	10/12	
-21							19/12	
-22							27/12	
-23							32/12	
-24			CL: Strong brown (7.5 YR 5/6) CLAY; mottled with light bluish grays (Gley 2 7/1) little silt, low plasticity, stiff; dry, slightly moist.		24-28	100	16/12	
-25							33/12	
-26							46/12	
-27			SC: Strong brown (7.5 YR 5/6) CLAY and medium SAND to fine SAND at depth; dense to loose, wet.				50/10	
-28			SW: Yellowish red (5 YR 4/6) fine to medium SAND; loose, little clay; wet.		28-32	67	5/12	
-29							21/12	
-30			SW: Very dark gray (5 YR 3/1) medium SAND; loose, wet.				16/12	
-31			CL: Yellowish red (5 YR 4/6) CLAY; little sand, moist.				28/12	
-32			SW: Yellowish red (5 YR 4/6) medium SAND; loose; trace to some clay at depth; wet.				16/12	
-33			CL-ML: Yellowish red (5 YR 4/6) CLAY and SILT; stiff, low plasticity, moist.		32-36	100	24/12	
-34			SC: Yellowish red (5 YR 4/6) medium SAND; some clay, moist.				26/12	
-35			CL: Yellowish red (7.5 YR 4/6) and yellowish brown (10 YR 5/8) CLAY; some silt, some mottling; stiff, medium plasticity, slightly moist.				26/12	
-36			ML: Black SILT; some clay; dry.				10/12	
-37			CL: Mottled yellowish brown (10 YR 5/8) and very pale brown (10 YR 7/4) CLAY; little silt, little medium sand; stiff, medium plasticity, moist.		36-40	100	14/12	
-38			OL: Yellowish brown SILT; little clay, little black organics; fairly stiff, dry.				100/11	CARBONATES
-39			OL: Very pale brown (10 YR 7/4) SILT; little yellowish brown (10 YR 5/8) silt, trace black organics, trace fine gravel. Dry.					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-22

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-40			ML: Very pale brown (10 YR 7/4) SILT; some to little fine gravel and coarse sand, dense; moist.		40-44	100	40/12	
-41			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; some medium sand at top, stiff, moist.				52/12	
-42							71/12	
-43							94/12	
-44			ML: Yellowish red (5 YR 4/6) and greenish gray (Gley 1 6/1) SILT; little fine gravel, stiff, slightly moist.		44-48	100	29/12	
-45							53/12	
-46			ML: Greenish gray (Gley 1 6/1) SILT; little medium sand, little white gravel at depth; stiff, slightly moist.				60/12	
-47							72/12	
-48			ML: Greenish gray (Gley 1 6/1) SILT and white fine GRAVEL; very stiff, slightly moist (weather LS).		48-50	100	24/12	
-49							145/12	
-50			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-23**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: FLOR RIVERA

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/21/2008

Date Completed: 4/21/2008

Depth of Hole (ft): 34.00

Boring/Well: MONITORING WELL

Elevation (ft): 28.45

Northing (m): 867224.9043

Easting (m): 762468.1612

UTM NAD83

Gauged Depth to Water (ft): 3.92

Conditions: Asphalt/Gravel

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: FILL					
-1								
-2								
-3								
-4			FILL: Fill material, dark yellowish brown (10 YR 4/4) CLAY and SILT, high plasticity, soft; some coarse sand. Moist.		4-8	0.167	7/12	
-5							5/12	
-6							6/12	
-7							6/12	
-8			CL-ML: Brownish yellow (10 YR 5/8) and light bluish gray (Gley 2 7/1) CLAY and SILT; soft, medium plasticity; slightly moist.		8-12	100	4/12	
-9							6/12	
-10							11/12	
-11			CL-ML: Gray (10 YR 6/1) and brownish yellow (10 YR 5/8) CLAY and black SILT (organics); soft; medium plasticity; slightly moist.				16/12	
-12			CL-ML: Dark yellowish brown (10 YR 4/4) CLAY and SILT; stiffening, mostly dry.		12-16	100	28/12	
-13			GM: Very pale brown (10 YR 8/3) SILT and fine GRAVEL; dense/stiff, dry.				50/8	
-14								
-15								
-16			ML: Light greenish gray (Gley 1 7/1) and brownish yellow (10 YR 5/8) SILT; some yellowish red (5 YR 4/6) silt, trace clay; stiff, dry.		16-20	100	16/12	
-17								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-23

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-18							38/12	
-19							59/12	
-20							75/12	
-20			CL-ML: Light greenish gray (Gley 1 7/1) CLAY and SILT; some coarse sand, soft, medium plasticity; moist.		20-24	100	27/12	BEGIN CARBONATE ZONE
-21			ML: Light greenish gray (Gley 1 7/1) and yellowish brown (10 YR 5/8) SILT; little coarse sand, dense/stiff, slightly moist.				52/8	
-22			SP: Very pale brown (10 YR 8/2) coarse SAND; some fine gravel and silt, dense; very moist/wet.					
-23								
-24								
-24			SW: Very pale brown (10 YR 8/2) coarse SAND and fine to coarse GRAVEL; little silt, dense; wet.		24-26	100	50/6	
-25			SM: Light greenish gray (Gley 1 7/1), very pale brown (10 YR 8/2) and yellowish brown (10 YR 5/8) SILT and coarse SAND; very moist.					
-26								
-26			GM: Very pale brown (10 YR 8/2) coarse SAND, fine GRAVEL, and SILT; dense; very moist, wet; becoming siltier at depth.		26-28	100	145/12	
-27								
-28								
-28			GM: Very pale brown (10 YR 8/2) fine GRAVEL, coarse SAND, and SILT; dense, wet.		28-32	100	100/12	
-29								
-30								
-31								
-32								
-32			GW: Very pale brown (10 YR 8/2) coarse GRAVEL; some coarse sand, little silt; wet.		32-34	100	50/12	
-33			ML: Yellowish brown (10 YR 5/6) SILT; little medium sand, stiff; slightly moist.				100/4	
-34			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-24

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 4/18/2008

Date Completed: 4/18/2008

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 22.05

Northing (m): 867774.7022

Easting (m): 763098.2129

UTM NAD83

Gauged Depth to Water (ft): 4.4

Conditions: Asphalt

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: FILL					
-1								
-2								
-3								
-4			FILL: FILL		4-8	60	4/12	
-5			CL: Very dark gray (10 YR 3/1) CLAY; becoming grayish brown (10 YR 5/2), light bluish gray (Gley 2 7/1) and yellowish brown (10 YR 5/8); little medium sand and silt, highly plastic, soft; moist.				5/12	
-6							5/12	
-7							9/12	
-8			SC-SM: Mottled light bluish gray (Gley 2 7/1), yellowish red (5 YR 4/6) and yellowish brown (10 YR 5/8) CLAY, SILT, and medium SAND; low to medium plasticity; fairly soft. Moist.		8-12	83	4/12	
-9							8/12	
-10							18/12	
-11							21/12	
-12			SC: Yellowish brown (10 YR 5/8) and light bluish gray (Gley 2 7/1) CLAY and medium SAND; moist. SP: Yellowish brown (10 YR 5/8), alternating with light bluish gray (Gley 2 7/1) medium SAND; loose, wet.		12-16	100	14/12	
-13							20/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-24

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-14							27/12	
-15							15/12	
-16			CL-ML: Light bluish gray (Gley 2 7/1) and yellowish red (5 YR 4/6) CLAY and SILT; little coarse sand, fairly soft, medium plasticity; moist.		16-20	0	17/12	
-17			UNKNOWN: NO RECOVERY				28/12	
-18							50/6	
-19								
-20			SP: Brownish yellow (10 YR 6/8) medium SAND; trace silt, loose; wet.		20-24	100	7/12	
-21							23/12	
-22							33/12	
-23							31/12	
-24			CL-ML: Mottled yellowish red (5 YR 4/6) and light bluish gray (Gley 2 7/1) CLAY and SILT; little medium sand; fairly stiff; moist.		24-28	75	16/12	
-25			SP: Yellowish red (5 YR 4/6) medium SAND; loose, wet.				30/12	
-26			CL: Yellowish red (5 YR 4/6), light bluish gray (Gley 2 7/1) and yellowish brown (10 YR 5/8) mottled CLAY; some silt, stiff; low plasticity; little to trace medium sand. Slightly moist.				35/12	
-27			CL-ML: Yellowish brown (10 YR 5/8) and strong brown (7.5 YR 4/6) CLAY and SILT; little black silt, stiff; moist.				42/12	
-28			CL: Mottled yellowish brown (10 YR 5/8) yellowish red (5 YR 4/6), little light bluish gray (Gley 2 7/1) CLAY; some/little black silt, stiff; low plasticity, moist.		28-32	83	11/12	
-29							22/12	
-30							30/12	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-24

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-31			ML: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) SILT; some fine gravel, slightly moist.				45/12	
-32			ML: Yellow (10 YR 7/6) and yellowish brown (10 YR 5/8) SILT; moist.		32-36	100	13/12	
-33			OH: Blue to bluish gray (Gley 2 5/1) CLAY; highly plastic; moist.					
-33			ML: Pale brown (10 YR 6/3) SILT; trace fine sand, moist.				30/12	
-34			SM: Very pale brown (10 YR 7/4) and light greenish gray (Gley 1 7/1) to yellowish brown (10 YR 5/8) SILT and fine SAND; very moist.				44/12	
-35							53/12	
-36			ML: Greenish gray (Gley 1 6/1) and strong brown (7.5 YR 5/6) SILT; stiffening; trace medium sand, moist.		36-40	100	53/12	
-37							36/12	
-38			CL-ML: Yellowish brown (10 YR 5/8) and very pale brown (10 YR 7/4) SILT and CLAY; stiff; little medium sand; very moist.				50/9	
-38			ML: Very pale brown (10 YR 7/4) SILT; some fine gravel and medium sand; trace clay; very moist/wet.					
-39			END OF SAMPLING					
-40								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **MW-25**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 9/18/2008

Date Completed: 9/18/2008

Depth of Hole (ft): 35.00

Boring/Well: MONITORING WELL

Elevation (ft): 19.96

Northing (m): 867786.2588

Easting (m): 762360.9860

UTM NAD83

Gauged Depth to Water (ft): 14.61

Conditions: Grass

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Organics to FILL (clay, silt, little fine sand, little medium gravel).		0-4	29.2	5	
-1							6	
-2							10	
-3							12	
-4			CL: Mottled (light bluish gray (Gley 2 8/1) yellowish brown (10 YR 5/8) yellowish red (5 YR 4/6)) CLAY; little silt, trace coarse sand at depth; highly plastic, soft; slightly moist.		4-8	100	4	
-5							8	
-6							10	
-7							12	
-8			CL: Mottled light bluish gray (Gley 2 8/1), yellowish red (5 YR 4/6), and brownish yellow (10 YR 6/8) CLAY; little silt and medium sand; medium plasticity, stiff, dry.		8-12	100	8	
-9							17	
-10			SW: Brownish yellow (10 YR 6/8) fine to medium SAND; loose, moist.				42	
-11							40	
-12			CL-ML: Light bluish gray (Gley 2 8/1) CLAY and SILT; low plasticity, stiff. Dry.					
-13			CL-ML: Light bluish gray (Gley 2 8/1) CLAY and SILT; some medium sand, little brownish yellow (10 YR 6/8) silt; fairly stiff/dense, moist.		12-16	83	12	
-14							20	
-15			SM: Purplish medium to coarse SAND with striations of light yellowish brown (10 YR 6/4) SILT; dense, moist.				48	
-16								
-17			CL: Mottled/striated light bluish gray (Gley 2 8/1), yellowish brown (10 YR 5/8), and brown (10 YR 4/3) CLAY; some silt, little medium to coarse sand at intervals; stiff, moist to very moist at sand intervals.		16-20	100	16	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-25

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-18							17	
-19							27	
-20							30	
-21			CL: Light bluish gray (Gley 2 8/1) and yellowish brown (10 YR 5/8) CLAY; little sand at top of interval; medium plasticity; little silt, medium stiffness; slightly moist.		20-24	100	10	
-22							10	
-23			OL: Yellowish brown (10 YR 5/8) and black (organics) SILT; some clay, fairly soft; moist.				15	
-24							21	
-25			GM: Yellow (10 YR 7/8) and very pale brown (10 YR 7/4) SILT and fine GRAVEL; fairly stiff/dense, very moist.		24-28	54	2	BEGIN CARBONATES
-26							14	
-27			OL: Dark yellowish brown (10 YR 3/6) and black SILT; little fine gravel and clay, soft; wet.				7	
-28							2	
-29			GM: Very pale brown (10 YR 7/4) fine GRAVEL and SILT; dense/stiff; moist		28-32	100	0	
-30							51	
-31							100/4"	
-32			SM: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) fine SAND; some silt, more at depth; wet.		32-36	100	34	
-33							63	
-34			ML: Greenish gray (Gley 1 6/1) and yellowish brown (10 YR 5/8) SILT; stiff, fairly dry.				100/11"	
-35			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-26

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: SPLIT SPOON, 4', 150 LB HAMMER

Drill Type: HSA

Date Started: 9/15/2008

Date Completed: 9/16/2008

Depth of Hole (ft): 40.00

Boring/Well: MONITORING WELL

Elevation (ft): 19.93

Northing (m): 867949.2386

Easting (m): 762407.0179

UTM NAD83

Gauged Depth to Water (ft): 14.46

Conditions: Grass

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: FILL, mostly clay and silt, moist.					
-1								
-2								
-3								
-4			GW: Coarse white GRAVEL.		4-8	21	10	
-5			CH: Light bluish gray (Gley 2 8/1) some yellowish red (5 YR 4/6) CLAY; little silt, highly plastic; slightly moist.				10	
-6							12	
-7							13	
-8			CH: Light bluish gray (Gley 2 8/1) and yellowish red (5 YR 4/6) CLAY; trace silt, soft; highly plastic, very moist.		8-12	83	3	
-9							8	
-10			CH: Yellowish red (5 YR 4/6) and dark yellowish brown (10 YR 3/4) CLAY; little silt, little coarse sand; med-high plasticity, soft, wet.				12	
-11			CH: Light bluish gray (Gley 2 8/1) CLAY; some yellowish red (5 YR 4/6) silt; little to some fine gravel; stiff, medium plasticity, moist.				24	
-12			CL-ML: Banded, striated yellowish red (5 YR 4/6) SILT and light bluish gray (Gley 2 8/1) CLAY; little fine gravel, stiff; medium plasticity; trace black fine gravel, dry.		12-16	96	9	
-13							18	
-14							28	
-15							32	
-16			CL: Light bluish gray (Gley 2 8/1) CLAY; medium plasticity, fairly soft; dry.		16-20	100	12	
-17							18	
-18							20	
-19			CL-ML: Yellowish red (5 YR 4/6), some yellowish brown (10 YR 5/8) SILT and CLAY; little light bluish gray (Gley 2 8/1) clay; trace black silt (organics); stiff, dry.				26	
-20			CL: Yellowish red (5 YR 4/6) CLAY; stiff, dry.		20-24	100	10	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: MW-26

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-21			SW: Yellowish brown (10 YR 5/6) fine SAND; little clay, moist; ML: Yellowish brown (10 YR 5/6) SILT; some clay, some black silt; stiff; dry.				15	
-22			ML: Brownish yellow (10 YR 6/6) and black SILT; some clay; low to medium plasticity; stiff, dry.				22	
-23							23	
-24			OL: Yellow (10 YR 7/8) and brownish yellow (10 YR 6/8) and black SILT; little clay, soft; slightly moist.		24-28	100	23	
-25							6	
-26			OL: Yellow (10 YR 7/8) and brownish yellow (10 YR 6/8) SILT; trace clay, trace fine gravel; very soft, very moist.				8	
-27			OL: Strong brown (7.5 YR 5/8) little black SILT; trace clay, fine white gravel at top of interval; very stiff, mostly dry.				14	
-28			GM: Very pale brown (10 YR 7/4) medium GRAVEL; wet. CL-ML: Strong brown (7.5 YR 5/8) SILT and CLAY; stiff.		28-32	79	10	BEGIN CARBONATE ZONE
-29			GM: Very pale brown (10 YR 7/4) fine to coarse GRAVEL; some strong brown silt; some coarse sand; loose, wet.				14	
-30							16	
-31							12	
-32			GM: Yellow (10 YR 7/8) SILT and very pale brown (10 YR 7/4) fine GRAVEL; fairly dense, wet to very moist.		32-36	100	8	
-33							23	
-34							37	
-35			OL: Brownish yellow (10 YR 6/8) SILT; some fine to coarse gravel, stiffening; moist.				34	
-36			GM: Yellowish brown (10 YR 5/6) SILT and coarse white GRAVEL; wet.		36-40	62.5	3	
-37			GM: Very pale brown (10 YR 7/4) and yellow (10 YR 7/8) SILT and fine to medium GRAVEL; dense, stiffening; moist.				1	
-38			OL: Light gray (10 YR 7/2) SILT; some fine to medium gravel, little yellowish brown (10 YR 5/6) silt at depth; stiff, fairly dry.				55	
-39							50/4"	
-40			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-1**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/12/2008

Date Completed: 12/15/2008

Depth of Hole (ft): 76.00

Boring/Well: MONITORING WELL

Elevation (ft):

Northing (m):

Easting (m):

UTM NAD83

Gauged Depth to Water (ft):

Conditions: Grass off Route 22--westernmost well

Comments: Offpost wells

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0								
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
-35								
-36								
-37								
-38								
-39								
-40								
-41								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: OP-1

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-42								
-43								
-44								
-45								
-46			OH: Yellowish brown (10 YR 5/8) little yellowish red (5 YR 4/6) CLAY; stiff, medium plasticity, little silt (black) trace fine sand.		45-47	100	29/12 36/12	
-47								
-48								
-49								
-50								
-51			SW: Yellow (10 YR 7/6) to yellowish brown (10 YR 5/8) fine SAND; loose, wet; little clay.		50-52	60	31/12 11/12	BEGIN CARBONATE ZONE
-52			GP: Very pale brown (10 YR 7/4) fine to coarse GRAVEL; little silt and coarse sand; wet.					
-53								
-54								
-55					55-57	60	50/12 11/12	
-56			GP: Very pale brown (10 YR 7/4) fine to coarse GRAVEL; little silt and coarse sand; wet.					
-57								
-58								
-59								
-60								
-61			CL-ML: Strong brown (7.5 YR 4/6) CLAY and SILT; soft; little medium sand, moist.		60-62	60	18/12 94/12	
-62			GW: Very pale brown coarse GRAVEL; dense, weathered rock; mostly dry.					
-63								
-64								
-65					65-67	90	100/9	
-66			GW: Very pale brown (10 YR 7/4) coarse GRAVEL, dense, weathered rock; mostly dry.					
-67								
-68								
-69								
-70					70-72	100	100/7	
-71			GW: Very pale brown (10 YR 7/4) coarse GRAVEL; dense, weathered rock; mostly dry.					
-72								
-73								
-74								
-75					75-77	100	100/3	
-76			GW: Very pale brown (10 YR 7/4) coarse GRAVEL; dense, weathered rock; mostly dry.					
			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-2**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/17/2008

Date Completed: 12/17/2008

Depth of Hole (ft): 75.00

Boring/Well: MONITORING WELL

Elevation (ft):

Northing (m):

Easting (m):

UTM NAD83

Gauged Depth to Water (ft):

Conditions: Grass/tall vegetation near CPR pipeline, ~30 yards off Route 22

Comments: Offpost wells

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0								
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
35								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: OP-2

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-35								
-36								
-37								
-38								
-39								
-40								
-41			CL: Yellowish red (5 YR 4/6) to strong brown (7.5 YR 4/6) to yellowish brown (10 YR 5/8) CLAY; medium plasticity, stiffening at depth; little silt, little medium gravel at depth.		40-42	83	6/12 13/12	
-42								
-43								
-44								
-45								
-46			CL: Mottled/striated yellowish red (5 YR 4/6), strong brown (7.5 YR 4/6) and yellowish brown (10 YR 5/8) CLAY; some silt, medium stiffness and plasticity. Mostly dry.		45-47	100	20/12 70/12	BEGIN CARBONATE ZONE
-47			GP: Fine to coarse yellow (10 YR 7/6) to very pale brown (10 YR 8/3) GRAVEL; some coarse sand, little clay/silt, dense, wet.					
-48								
-49								
-50								
-51			GP: Yellow (10 YR 7/6) and very pale brown (10 YR 8/3) fine to coarse GRAVEL; some coarse sand, little silt, dense; very moist.		50-52	83	102/12	
-52								
-53								
-54								
-55								
-56			SC-SM: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) CLAY, SILT, and coarse SAND; highly plastic, soft, wet.		55-57	100	55/12 92/12	
-57			GM: Very pale brown (10 YR 8/3) fine to coarse GRAVEL and yellowish brown SILT; dense, moist.					
-58								
-59								
-60								
-61			GP: Yellow (10 YR 7/8) little very pale brown (10 YR 8/3) fine to coarse GRAVEL; some coarse sand, little silt; dense, wet.		60-62	67	25/12 29/12	
-62								
-63								
-64								
-65								
-66			GP: Yellow (10 YR 7/8) and very pale brown (10 YR 8/3) fine to coarse GRAVEL; some coarse sand, little clay, trace silt; medium density, wet.		65-67	60	20/12 27/12	
-67								
-68								
-69								
-70								
-71			GW: Yellow (10 YR 7/8) coarse GRAVEL; little coarse sand, little clay; dense, wet.		70-72	50	28/12 24/12	
-72			GM: White (10 YR 8/1), some black (10 YR 2/1) fine GRAVEL and SILT; little yellowish brown (10 YR 5/8) silt. Slightly moist.					
-73								
-74			GM: Yellow (10 YR 7/8) coarse GRAVEL and SILT; dense, slightly moist.		73-75	60	26/12 38/12	
-75			ML: Light greenish gray (Gley 1 7/1) little yellowish brown (10 YR 5/8) SILT; dense. Slightly moist/dry.					
			END OF SAMPLING					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-3**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/9/2008

Date Completed: 12/10/2008

Depth of Hole (ft): 87.00

Boring/Well: MONITORING WELL

Elevation (ft):

Northing (m):

Easting (m):

UTM NAD83

Gauged Depth to Water (ft):

Conditions: Grass near El Toro Creek off Route 22

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0								
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
-35								
-36								
-37								
-38								
-39								
-40								
-41								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: OP-3

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-42								
-43								
-44								
-45								
-46								
-47								
-48								
-49								
-50								
-51			GW: Very pale brown (10 YR 7/3) coarse GRAVEL; trace coarse sand and silt; dense, wet.		50-52	0.25	20/12 22/12	BEGIN CARBONATE ZONE
-52								
-53								
-54								
-55								
-56			GP: Very pale brown (10 YR 7/3) and yellow (10 YR 7/6) fine to coarse GRAVEL; some coarse sand; little silt. Dense, wet.		55-57	60	58/12 39/12	
-57								
-58								
-59								
-60								
-61			GP: Yellow (10 YR 7/6) some strong brown (7.5 YR 4/6) coarse GRAVEL; little coarse sand, little silt; dense, wet.		60-62	60	19/12 28/12	
-62								
-63								
-64								
-65								
-66			GP: Yellow (10 YR 7/6) fine to coarse GRAVEL; little to some silt and coarse sand; dense, wet.		65-67	60	77/12 100/8	
-67								
-68								
-69								
-70								
-71			GC: Strong brown (7.5 YR 4/6) CLAY and coarse yellow (10 YR 7/6) GRAVEL; soft, highly plastic; wet.		70-72	75	72/12 27/12	
-72			GP: Very pale brown (10 YR 7/4) coarse GRAVEL; some coarse sand, trace silt; dense, wet.					
-73								
-74								
-75								
-76			GP: Yellow (10 YR 7/6) fine to coarse GRAVEL and coarse SAND; trace silt, dense, wet.		75-77	60	29/12 100/9	
-77								
-78								
-79								
-80								
-81			GM: Yellow (10 YR 7/6) coarse GRAVEL; some silt, some coarse sand; dense; very moist to wet.		80-82	55	24/12 54/12	
-82			GM: Yellow (10 YR 7/6) and very pale brown (10 YR 7/4) coarse GRAVEL and SILT; little coarse sand, dense/stiff; moist.					
-83								
-84								
-85								
-86			GM: Yellow (10 YR 7/6) and very pale brown (10 YR 7/4) coarse GRAVEL and SILT; dense, moist.		85-87	100	29/12 36/8	
-87			ML: Light gray (10 YR 7/2) and yellowish brown (10 YR 5/8) becoming slightly greenish gray (Gley 2 7/1) SILT; little fine to coarse gravel; medium stiff. Mostly dry.					
			END OF SAMPLING					



Geologist: BILL HARVEY

Name of Driller: FLOR RIVERA

Drill Type: HSA

Boring/Well: MONITORING WELL

Gauged Depth to Water (ft):

Conditions: Grass off Route 22

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0								
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								
-34								
-35								
-36								
-37								
-38								
-39								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: OP-4

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-40			CL: Yellowish red (5 YR 5/8) and strong brown (7.5 YR 5/8) CLAY; medium-high plasticity little silt, soft. Dry.		40-42	71	4/12	
-41			SC-SM: Yellowish red (5 YR 5/8), strong brown (7.5 YR 5/8) CLAY, SILT, and fine SAND; soft, wet.				9/12	
-42								
-43								
-44								
-45			CL-ML: Yellowish red (5 YR 5/8), strong brown (7.5 YR 5/8), brownish yellow (10 YR 6/8) mottled CLAY and SILT; some black oxidized silt; highly plastic, soft. Moist.		45-47	100	4/12	
-46							5/12	
-47								
-48								
-49								
-50			CL: Yellowish red (5 YR 5/8) to yellow (10 Yr 7/6) CLAY; some silt, medium plasticity, very soft. Moist.		50-52	75	3/12	
-51							4/12	
-52								
-53								
-54								BEGIN CARBONATE ZONE
-55			GW: Yellow (10 YR 7/6) and very pale brown (10 YR 7/4) GRAVEL; little silt and coarse sand, dense; wet.		55-57	90	58/12	
-56							75/10	
-57								
-58								
-59								
-60			SW: Yellow (10 YR 7/6) coarse SAND; trace silt; loose, wet.		60-62	100	22/12	
-61			GP: Very pale brown (10 YR 7/4) fine to coarse GRAVEL and coarse SAND; little silt, dense, wet.				75/3	
-62								
-63								
-64								
-65			GP: Yellow (10 YR 7/6) fine to coarse GRAVEL and coarse SAND; dense, trace yellowish red (5 YR 4/6) silt; wet.		65-67	100	43/12	
-66							75/4	
-67								
-68								
-69								
-70			GP: Very pale brown (10 YR 7/4) coarse SAND and coarse GRAVEL; dense; little dark yellowish brown (10 YR 4/6) clay; wet.		70-72	55	34/12	
-71							13/12	
-72			CL: Mottled very pale brown (10 YR 7/4) yellowish red (5 YR 5/8) CLAY; little silt; highly plastic, soft. Moist.					
-73			SW: Very pale brown (10 YR 7/4) and yellow (10 YR 7/6) coarse SAND; little silt, dense; wet.		73-75	100	77/12	
-74			GW: Very pale brown (10 YR 7/4) coarse angular to round GRAVEL; little coarse sand, trace silt; dense, wet.					
-75								
-76								
-77								
-78			GM: White (10 YR 8/1) coarse GRAVEL; some yellow (10 YR 7/6) to dark yellowish brown (10 YR 4/6) silt; little coarse sand; dense, wet.		78-80	100	75/8	
-79								
-80								
-81								
-82			GM: Very pale brown (10 YR 7/4) little yellowish brown (10 YR 5/8) coarse GRAVEL and SILT; some coarse sand; dense, moist.		82-84	100	54/12	
-83			ML: Light greenish gray (Gley 1 7/1) and yellowish brown (10 YR 5/8) SILT; stiff, mostly dry.				54/12	
-84			ML: Dark bluish gray (Gley 2 4/1) SILT. Stiff.					
			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-5**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 12/1/2008

Date Completed: 12/3/2008

Depth of Hole (ft): 86.00

Boring/Well: MONITORING WELL

Elevation (ft):

Northing (m):

Easting (m):

UTM NAD83

Gauged Depth to Water (ft):

Conditions: Grass near Route 22

Comments: Offpost wells

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Mottled CLAY, fine to coarse GRAVEL, little silt. Dry. (FILL)		0-4	42	4/12	
-1							10/12	
-2							9/12	
-3							6/12	
-4					4-8	0	3/12	
-5							1/12	
-6							1/12	
-7							4/12	
-8					8-12	50	4/12	
-9			CH: Gray (10 YR 5/1) CLAY; very soft, high plasticity; little light bluish gray (Gley 2 7/1) clay. Dry.				2/12	
-10							1/12	
-11							3/12	
-12					12-16	63	4/12	
-13			CL: Highly mottled yellowish red (5 YR 4/6), light bluish gray (Gley 2 7/1) and yellowish brown (10 YR 5/8) CLAY; little silt, low plasticity; stiff. Dry.				7/12	
-14							13/12	
-15							20/12	
-16					16-20	100	9/12	
-17			CL: Mottled yellowish red (5 YR 4/6), white (10 YR 8/1), and yellowish brown (10 YR 5/8) CLAY; some silt; low plasticity, stiff, dry.				10/12	
-18			CH: Mottled yellowish red (5 YR 4/6) and yellowish brown (10 YR 5/8) CLAY to light bluish gray (Gley 2 7/1) CLAY; highly plastic, soft, dry.				19/12	
-19							26/12	
-20					20-24	100	9/12	
-21			CH: Light bluish gray (Gley 2 8/1) CLAY; very soft, highly plastic; some mottles of yellowish red (5 YR 4/6); trace silt. Dry.				16/12	
-22							31/12	
-23			CL: Light bluish gray (Gley 2 8/1), yellowish brown (10 YR 5/8) CLAY; some silt; stiff; medium plasticity, dry.				25/12	
-24					24-28	100	13/12	
-25			CL: Light bluish gray (Gley 2 8/1) CLAY; little yellowish brown (10 YR 5/8) silt; highly plastic, soft, dry.				30/12	
-26							41/12	
-27			CL-ML: Yellowish brown (10 YR 5/8) CLAY and SILT; little yellowish red (5 YR 4/6) mottles; little black silt. Low plasticity, fairly stiff, dry.				49/12	
-28					28-32	100	16/12	
-29			CL: Yellowish brown (10 YR 5/8) CLAY, some silt; little black silt (organics), trace fine black (magnesium oxides) gravel. Low to medium plasticity, stiffening. Dry.				33/12	
-30							49/12	
-31							50/12	
-32					32-36	100	11/12	
-33			CL-ML: Yellowish brown (10 YR 5/8) CLAY and black SILT (organics); medium stiffness, low plasticity, dry.				28/12	
-34								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: OP-5

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-35							43/12	
-36							51/12	
-37			CL: Mottled yellowish brown (10 YR 5/8), black, dark reddish brown (5 YR 3/4) CLAY; some silt, stiff, low-medium plasticity, dry.		36-40	100	19/12	
-38							33/12	
-39							48/12	
-40							54/12	
-41			CL: Mottled yellowish red (5 YR 4/6) yellowish brown (10 YR 5/8) and black CLAY, some silt; trace fine gravel; very stiff, low plasticity. Dry.		40-44	83	14/12	
-42							29/12	
-43			GP: Yellow (10 YR 8/6, 7/8) fine SAND and fine GRAVEL; loose, wet.				36/12	
-44			GW: Yellow (10 YR 7/8) medium to coarse GRAVEL; little coarse sand, little yellowish brown (10 YR 5/8) clay; loose, wet.		44-48	50	47/12	BEGIN CARBONATE ZONE
-45							16/12	
-46							39/12	
-47							30/12	
-48			GW: White, yellow (10 YR 7/8) coarse GRAVEL; some coarse sand; little to trace brown (10 YR 4/3) clay; loose, wet.		48-52	48	27/12	
-49							59/12	
-50							29/12	
-51							20/12	
-52			GP: White, yellow (10 YR 7/8) fine to coarse GRAVEL; some coarse sand; some brown (10 YR 4/3) clay; little silt. Wet.		52-56	64	18/12	
-53							28/12	
-54							21/12	
-55							12/12	
-56			GM: White, yellow (10 YR 7/8) coarse GRAVEL; some brown (10 YR 4/3) silt; dense, wet.		56-60	100	75/11	
-57							100/8	
-58								
-59								
-60			GW: Yellow (10 YR 7/8) and white medium to coarse GRAVEL; little yellow silt and clay, wet.		60-64	53	38/12	
-61			ML: Yellowish red (5 YR 4/6) SILT; trace clay, stiff.				48/12	
-62			SM: Dark reddish brown (5 YR 3/4) and reddish brown (5 YR 4/4) fine SAND and SILT; wet.				22/12	
-63			SM: Brownish yellow (10 YR 6/8) fine SAND and SILT, wet.				15/12	
-64			GW: Yellow (10 YR 7/8) coarse GRAVEL, little coarse sand, little silt (greater at depth); dense, wet.		64-68	58	20/12	
-65							8/12	
-66							40/12	
-67							26/12	
-68			GM: Yellow (10 YR 7/8) coarse SAND and coarse white GRAVEL; some dark yellowish brown (10 YR 4/4) silt; dense, wet.		68-72	52	26/12	
-69							22/12	
-70							40/12	
-71							130/12	
-72			GP: Very pale brown (10 YR 7/4) and yellow (10 YR 7/8) coarse GRAVEL and SAND; little silt, dense; wet.		72-76	69	47/12	
-73			CH: Strong brown (7.5 YR 5/8) CLAY; highly plastic, little silt; soft. Dry.				43/12	
-74			GM: Very pale brown (10 YR 8/3) SILT and medium GRAVEL; some coarse sand; moist.				20/12	
-75							42/12	
-76								

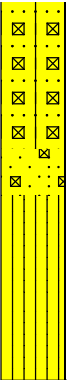
Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: OP-5

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name					
				VOC (ppm)									
-77			GM: Very pale brown (10 YR 8/3) SILT, fine GRAVEL, and coarse SAND; little iron oxides, stiffer, very moist.		76-80	100	35/12 100/11						
-78			GP: Yellow (10 YR 7/8) coarse GRAVEL and coarse SAND; little silt, wet.		80-84	69	20/12 24/12 50/8						
-79													
-80													
-81			ML: Yellow (10 YR 7/8) and light brownish gray (10 YR 6/2) SILT; little to some coarse sand, moist.		84-86	100	100/8						
-82			ML: Light greenish gray (Gley 1 7/1) little brownish yellow (10 YR 6/8) SILT and medium angular GRAVEL; dense, moist.										
-83													
-84			ML: Light greenish gray (Gley 1 7/1) little brownish yellow (10 YR 6/8) SILT and medium angular GRAVEL; dense, moist.		84-86	100	100/8						
-85													
-86			END OF SAMPLING										



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-6**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 2/17/2009

Date Completed: 2/18/2009

Depth of Hole (ft): 82.00

Boring/Well: MONITORING WELL

Elevation (ft): 13.47

Northing (ft): 871169.7782 Easting (ft): 761896.6345 UTM NAD83

Gauged Depth to Water (ft): 9.82

Conditions: Cleared path in undergrowth along pipeline

Comments: Offpost wells

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				

0			CL: Organic dark brown/black CLAY (no sampling); some moisture at 35'.					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								
-30								
-31								
-32								
-33								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-6**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 2/17/2009

Date Completed: 2/18/2009

Depth of Hole (ft): 82.00

Boring/Well: MONITORING WELL

Elevation (ft): 13.47

Northing (ft): 871169.7782 Easting (ft): 761896.6345 UTM NAD83

Depth to Water (ft): 9.82

Conditions: Cleared path in undergrowth along pipeline

Comments: Offpost wells

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				

-33								
-34								
-35								
-36								
-37								
-38								
-39								
-40								
-41			OH: Yellowish brown (10 YR 5/8), some black (10 YR 2/1) CLAY; some silt; dense, stiff; medium plasticity.		40-44	100	11/12	
-42							29/12	
-43							35/12	
-44			GC: Yellowish brown (10 YR 5/8) CLAY and coarse very pale brown (10 YR 7/4) GRAVEL; dense, very moist.				51/12	
-45			GP: Yellow (10 YR 7/6) fine to coarse GRAVEL; some coarse sand, little silt; fairly dense, wet.		45-46	100	72/8	BEGIN CARBONATE ZONE
-46								
-47								
-48			GP: Yellow (10 YR 7/6) coarse GRAVEL; some coarse sand, little yellowish brown (10 YR 5/6) clay; dense, wet.		48-52	58	28/12	
-49							16/12	
-50							20/12	
-51							35/12	
-52								
-53			GP: Yellow (10 YR 7/6) coarse GRAVEL; some coarse sand; little yellowish brown (10 YR 5/6) clay; dense, wet.		53-56	90	75/12	
-54							56/12	
-55							100/7	
-56								
-57			GP: Yellow (10 YR 7/6) coarse GRAVEL; some coarse sand; little yellowish brown (10 YR 5/6) clay; dense, wet.		57-59	76	100/12	
-58							100/9	
-59								
-60			GP: Yellow (10 YR 7/6) coarse GRAVEL; some coarse sand, little yellowish brown (10 YR 5/8) clay; dense, wet.		60-62	75	19/12	
-61							89/12	
-62								
-63								
-64			GP: Very pale brown (10 YR 8/4) coarse GRAVEL; some coarse sand; trace silt; dense, wet.		65-67	83	60/12	
-65								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-6**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 2/17/2009

Date Completed: 2/18/2009

Depth of Hole (ft): 82.00

Boring/Well: MONITORING WELL

Elevation (ft): 13.47

Northing (ft): 871169.7782 Easting (ft): 761896.6345 UTM NAD83

Depth to Water (ft): 9.82

Conditions: Cleared path in undergrowth along pipeline

Comments: Offpost wells

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				

-66			GP: Yellow (10 YR 7/8) fine to coarse GRAVEL; some coarse sand; little yellowish brown (10 YR 5/8) clay; dense/wet.					35/12
-67								
-68								
-69								
-70								
-71			GP-GC: Very pale brown (10 YR 7/4) to yellow (10 YR 7/8) coarse GRAVEL; some coarse sand; some yellowish brown (10 YR 5/8) clay; dense, wet.					47/12
-72								100/10
-73								
-74								
-75								
-76			GC: Yellow (10 YR 7/8) and yellowish brown (10 YR 5/8) fine to coarse GRAVEL; some clay; dense, wet.					100/9
-77								
-78								
-79								
-80			GC: Yellow (10 YR 7/8) fine to coarse GRAVEL; some yellowish brown (10 YR 5/8) clay; some coarse sand; dense, wet.					100/10
-81								
-82			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-7**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 2/19/2009

Date Completed: 2/20/2009

Depth of Hole (ft): 77.00

Boring/Well: MONITORING WELL

Elevation (ft): 14.24

Northing (ft): 871527.8845 Easting (ft): 762653.3993 UTM NAD83

Gauged Depth to Water (ft): 10.81

Conditions: Cleared path along CPR pipeline

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				

0			NS: No lithology collected					
-1								
-2								
-3								
-4								
-5								
-6								
-7								
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								
-21								
-22								
-23								
-24								
-25								
-26								
-27								
-28								
-29								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-7**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 2/19/2009

Date Completed: 2/20/2009

Depth of Hole (ft): 77.00

Boring/Well: MONITORING WELL

Elevation (ft): 14.24

Northing (ft): 871527.8845 Easting (ft): 762653.3993 UTM NAD83

Depth to Water (ft): 10.81

Conditions: Cleared path along CPR pipeline

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				

-30								
-31								
-32								
-33								
-34								
-35								
-36								
-37								
-38								
-39								
-40								
-41			OH: Yellowish brown (10 YR 5/8) CLAY and SILT; stiff; low to medium plasticity; trace black (10 YR 2/1) silt.		40-42	83	19/12 37/12	
-42								
-43								
-44								
-45			CL: Yellowish brown (10 YR 5/8) to brownish yellow (10 YR 6/6) CLAY; fairly stiff; little silt; medium plasticity.		45-47	92	13/12 24/12	
-46								
-47								
-48								
-49			CL: Yellowish brown (10 YR 5/8) CLAY; medium stiffness and plasticity.					
-50					50-52	100	10/12 19/12	
-51			CL: Dark yellowish brown (10 YR 4/6) CLAY; some silt; stiff; low plasticity.					
-52			CL: Mottled brownish yellow (10 YR 6/6) and bluish gray (Gley 2 5/1) CLAY; trace black (10 YR 2/1) silt; medium stiff; medium plasticity.					BEGIN CARBONATE ZONE
-53								
-54			GC: Gray (10 YR 6/1) to very pale brown (10 YR 7/4) CLAY and coarse GRAVEL; dense, very moist.					
-55					55-57	50	5/12 10/12	
-56			GP: Pale brown (10 YR 6/3) coarse GRAVEL; some fine gravel and coarse sand; little clay; loose, wet.					
-57								
-58								
-59								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **OP-7**

Geologist: BILL HARVEY

Subcontractor: GEOCIM

Name of Driller: FLOR RIVERA

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 2/19/2009

Date Completed: 2/20/2009

Depth of Hole (ft): 77.00

Boring/Well: MONITORING WELL

Elevation (ft): 14.24

Northing (ft): 871527.8845 Easting (ft): 762653.3993 UTM NAD83

Depth to Water (ft): 10.81

Conditions: Cleared path along CPR pipeline

Comments: Buchanan

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				

-59								
-60								
-61			GP: Pale brown (10 YR 6/3) fine to coarse GRAVEL; some coarse sand; little brown (10 YR 5/3) clay; medium dense; wet.		60-62	67	18/12 32/12	
-62								
-63								
-64								
-65								
-66			GW: Pale brown (10 YR 6/3) to very pale brown (10 YR 7/3) fine to coarse GRAVEL; little brown (10 YR 5/3) silt and clay; fairly dense, wet.		65-67	83	30/12 50/12	
-67								
-68								
-69								
-70								
-71			GW: Pale brown (10 YR 6/3) and very pale brown (10 YR 7/3) fine to coarse GRAVEL; little coarse sand, trace clay and silt; fairly dense, wet.		70-72	92	49/12 47/12	
-72								
-73								
-74								
-75								
-76			GC: Pale brown (10 YR 6/3) to brown (10 YR 5/3) fine GRAVEL and CLAY; more clay at depth; loose, wet.		75-77	67	18/12 20/12	
-77			END OF SAMPLING					



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **SB-3**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: EDUARDO SANTIAGO

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/20/2006

Date Completed: 10/24/2006

Depth of Hole (ft): 90.00

Boring/Well: BOREHOLE

Elevation (ft): 36.67

Northing (m): 867219.90 Easting (m): 760997.56 UTM NAD83

Gauged Depth to Water (ft): NA

Conditions: Asphalt between light poles 053/054

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Asphalt		0-4	50		
-1			GP: Very dark gray, round GRAVEL and coarse SAND (aggregate); moist.				6/6	
-2			CL: Reddish brown (5 YR 4/4) CLAY; little white clay, trace silt. Stiff.				7/12	
-3							10/12	
-4			CL: Strong brown (7.5 YR 5/6, 5/8) CLAY; little silt, little fine gravel, trace sand; striations of black clay/silt. Stiff.		4-8	50	16/12	SB-03-06-03-4-8
-5							7/12	
-6							7/12	
-7							18/12	
-8			CL: Pinkish white (5 YR 8/2) CLAY with regular intervals of reddish brown (5 YR 4/4) SILT and fine GRAVEL; very stiff. Dry.		8-12	79	31/12	
-9							19/12	
-10							29/12	
-11							38/12	
-12			CL: Pinkish white (2.5 YR 8/2) and red (2.5 YR 4/6) CLAY; trace silt. Very stiff, dry.		12-16	73	39/12	
-13							11/12	
-14							18/12	
-15							23/12	
-16			CL: Strong brown (7.5 YR 5/6) with black mottles CLAY; trace silt. Very stiff, dry.		16-20	100	28/12	
-17							9/12	
-18							18/12	
-19							23/12	
-20			CL: Strong brown (7.5 YR 5/1) CLAY; stiff.		20-24	100	30/12	SB-03-06-03-20-22
-21							4/12	
-22			GM: Very pale brown (10 YR 8/2) SILT and fine GRAVEL; trace fine sand, slightly moist.				32/12	
-23							46/12	
-24			SP: Brownish yellow (10 YR 5/6) fine SAND; trace silt, moist.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-3

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-24			SP: Brownish yellow fine SAND; moist.		24-26.75	91	55/12	
-25			ML: Pale yellow (2.5 Y 7/3) and brownish yellow SILT; some clay; slightly stiff; trace fine gravel and sand. Slightly moist.				19/12	
-26							27/12	
-27							100/9	
-28			GM: Very pale brown (10 YR 8/4) to yellow (10 YR 7/6) medium to coarse GRAVEL; some silt, tapering to stiff CLAY and GRAVEL; some silt, little medium sand. Moist.		28-32	79	63/12	
-29							46/12	
-30							39/12	
-31							45/12	
-32			GC: Pale brown (10 YR 8/4) CLAY and medium to coarse GRAVEL; trace medium sand. Very moist.		32-33.67	100	43/12	
-33			GM: Pale brown medium to coarse GRAVEL; some medium sand, little clay; very moist.				100/8	
-34								
-35								
-36			CL: Very pale brown (10 YR 8/3) CLAY and fine to medium GRAVEL; little medium sand, very moist.		36-36.67	100	100/8	
-37								
-38			SM: Brownish yellow (10 YR 6/6) and light gray (10 YR 7/1) medium SAND and SILT; little clay, trace fine gravel. Very moist.		38-38.5	100	100/6	
-39								
-40			GP: Very pale brown medium angular GRAVEL and medium SAND; wet.		40-43.5	100		
-41			SM: Yellowish brown fine SAND and SILT; moist.				38/12	
-42			ML: Dark bluish gray (Gley 2 4/1) and yellowish brown SILT; trace clay. Slightly moist.				33/12	
-43			OL: Dark bluish gray SILT; some small gravel and shells. Trace clay, very stiff. Dry.				58/12	
-44			GP: Dark bluish gray shells (medium GRAVEL); wet.		44-44.5	100	100/5	
-45							100/6	
-46			SM: Greenish gray (Gley 2 6/1, 5/1) fine SAND; little clay, trace silt. Wet.		46-47.75	100		
-47			SM: Greenish gray fine SAND and SILT; trace clay, trace medium gravel. Very moist.				74/12	
-48							100/9	
-49								
-50			GC: Greenish gray medium GRAVEL; some silt and medium sand; little clay. Stiff, moist.		50-50.5	100		
-51							100/5	
-52			SM: Greenish gray fine SAND; some silt, some clay, trace fine gravel, moist.		52-52.8	100		
-53								

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-3

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-54			GP: Greenish gray medium SAND and fine GRAVEL; trace clay and silt. Wet.		54-54.6	100	100/10	
-55							100/7	
-56			ML: Greenish gray SILT; some fine sand, trace fine to medium gravel. Moist, stiff.		56-57.2	100		
-57							100/12	
-58								
-59								
-60			ML: Light greenish gray (Gley 2, 7/1) SILT; little clay, trace medium sand, fine gravel.		60-60.5	100		
-61							100/5	
-62			OL: Light greenish gray SILT; little white fragments (carbonates). Very stiff.		62-62.5	100		
-63							100/6	
-64			ML: Light greenish gray SILT; very stiff.		64-65	100		
-65			ML: Dark greenish gray SILT; some fine to medium gravel, trace clay, very stiff.				100/12	
-66			ML: Dark greenish gray SILT; trace fine gravel.		66-66.5	100		
-67							100/6	
-68			GM: Dark greenish gray SILT and medium GRAVEL; trace fine sand.		68-69.25	100		
-69			ML: Dark greenish gray SILT; little fine sand.				27/6	
-70			ML: Very dark greenish gray (10 YR 3/1) SILT; some medium gravel at depth.		70-70.8	100	100/6	
-71			CL: Dark greenish gray CLAY; some silt, trace fine sand.				86/6	
-72			ML: Dark greenish gray SILT; little fine sand, trace gravel.		72-73.67	100	100/4	
-73							46/6	
-74			GM: Dark greenish gray SILT, medium SAND, and medium GRAVEL; moist.		74-74.67	100	52/6	
-75							85/6	
-76			SM: Dark greenish gray SILT and fine to medium SAND; moist.		76-77	100	100/6	
-77							50/6	
-78			SM: Dark greenish gray fine to medium SAND; some silt; very moist.		78-78.75	0.5	100/6	
-79							28/6	
-80			ML: Dark greenish gray (Gley 2 4/1) SILT; trace clay and medium gravel; stiff. Moist.		80-80.9	100	100/3	
-81							69/6	
-82			OL: Dark greenish gray SILT, trace clay, stiff. Evidence of		82-82.67	100	100/5	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **SB-3**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-83			calcium carbonates; slightly moist.				100/6	
-84			OL: Dark greenish gray SILT and CLAY; high amount of shell fragments (carbonates); very stiff, mostly dry.		84-85	100	38/6 100/6	
-85								
-86			OL: Dark greenish gray SILT; some clay, trace fine gravel, trace carbonates. Very stiff, dry.		86-87.25	100	54/6 47/6 100/3	
-87								
-88			OL: Dark greenish gray SILT; some fine gravel. Dry.		88-88.5	100	100/5	
-89								
-90								
-91								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21040
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **SB-7**

Geologist: BILL HARVEY

Subcontractor: JACA AND SIERRA

Name of Driller: IVAN

Equipment: HOLLOW STEM AUGERS (HSA) 8-in OD

Drill Type: HSA

Date Started: 10/10/2006

Date Completed: 10/13/2006

Depth of Hole (ft): 90.00

Boring/Well: BOREHOLE

Elevation (ft): 9.61

Northing (m): 868796.37 Easting (m): 761825.39 UTM NAD83

Gauged Depth to Water (ft): NA

Conditions: Asphalt between light poles 063/064

Comments:

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
0			FILL: Asphalt					
-1			GP: Fine to Coarse subangular GRAVEL; some medium gray (10 YR 5/1) sand; wet.		0.5-2	55	7/6	
-2			CL: Yellowish brown (10 YR 5/6) CLAY; some medium to coarse sand; trace gravel; wet.		2-3.5	33	8/6	
-3							7/6	
-4			CL: Gray (2.5 Y 5/1) CLAY; fairly stiff; trace fine to medium sand.		3.5-5	78	8/6	
-5							10/6	
-6					5-6.5	78	12/6	
-7			CL: Gray to yellowish brown (10 YR 5/4) CLAY; soft.		8	6.5-8	2/6	
-8							2/6	
-9			CL: Gray yellowish brown, brownish yellow (10 YR 6/6) CLAY; soft.		8-9.5	94	2/6	
-10			CH: Mottled yellowish brown, reddish brown (5 YR 4/4) CLAY; stiff; some dark yellowish brown clay.		9.5-11	94	4/6	
-11			CH: Highly mottled (Gley 2 7/1) bluish gray, reddish brown, black CLAY; trace weathered rock (sand). Medium stiffness, fairly plastic.		11-12.5	39	4/6	
-12							3/6	
-13			CH: Light bluish gray (Gley 2 7/1) CLAY; yellowish brown (10 YR 5/4) clay, trace sand. Medium stiffness, fairly plastic.		12.5-14	89	1/6	
-14			CL: Light bluish gray CLAY; trace silt. Stiff.		14-15.5	55	1/6	
-15							2/6	
-16					15.5-17	67	2/6	
-17			CL: Strong brown (7.5 YR 4/6) CLAY; some light bluish gray; grading to brown clay, some silt; trace fine gravel. Stiff.		17-18.5	89	3/6	
-18							3/6	
-19			CL: Brown (7.5 YR 4/6) stiff CLAY; some silt; trace fine gravel/coarse sand, very dark grayish brown (10 YR 3/2), more sand at depth.		18.5-20	78	3/6	
-20							5/6	
-21			CL: Brown CLAY, some silt, trace fine gravel grading to yellowish brown (10 YR 5/6) clay, little sand. Very stiff.		20-21.5	78	7/6	
-22			CL: Brown CLAY; little silt and sand, trace dark brown gravel. Very stiff.		21.5-23	78	10/6	
							3/6	
							6/6	
							9/6	
							4/6	

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-7

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-23			CL: Yellowish brown and light bluish gray CLAY; stiff; little silt, trace organics.		23-24.5	83	6/6 6/6 2/6	
-24							4/6	
-25			CL: Light brownish gray (10 YR 6/2) to brown CLAY; trace fine gravel/coarse sand; stiff; some fine sand at bottom of interval.		24.5-26	78	6/6 3/6 4/6	
-26			SC: Light brownish CLAY and SAND; wet.		26-27.5	94	6/6	
-27			CL: Light gray (10 YR 7/2) CLAY; little silt; trace black organics.				5/6 6/6	
-28			SW: Yellowish brown fine SAND. Wet.		27.5-29	83	8/6 4/6	
-29			CL: Light gray CLAY; some fine sand; little organics.				6/6	
-30			SW: Dark gray fine SAND (10 YR 4/1).		29-30.5	89	7/6 7/6 8/6	
-31			SP: Yellowish brown to dark grayish brown (10 YR 4/2) fine SAND; trace clay at depth, trace organics.					
-32			SW: Light brownish gray (10 YR 6/2) to yellowish brown medium to coarse SAND; trace clay.		30.5-32	89	13/6 4/6 10/6	
-33			SP: Light gray (10 YR 7/2) fine to medium SAND; trace silt and clay grading to yellowish brown medium SAND.		32-33.5	89	10/6 6/6 6/6	
-34			SP: Pale brown (10 YR 6/3) to very dark grayish brown (10 YR 3/2) to yellowish brown fine to medium SAND; trace clay and silt.		33.5-35	55	12/6 5/6 7/6	
-35			SP: Yellowish brown fine SAND; little clay.		35-36.5	83	9/6 6/6 9/6	
-36			CL: Yellowish brown to brown CLAY; trace sand.					
-37			GP: Brownish yellow (10 YR 6/6) medium to coarse GRAVEL.		36.5-38	83	13/6 7/6 3/6	
-38			GP: Fine to coarse yellowish brown GRAVEL; some coarse sand, trace clay.					
-39			GC: Brownish yellow to yellow (10 YR 6/6, 7/6) medium GRAVEL; little clay; to CLAY and SAND; to medium GRAVEL; some medium sand, trace clay.		38-39.5	67	2/6 3/6 5/6	
-40			GC: Brown CLAY and medium SAND/fine GRAVEL; soft.		39.5-41	67	6/6 4/6 7/6	
-41			GP: Brownish yellow medium GRAVEL; little clay.					
-42			GP: Brownish yellow/yellow (10 YR 6/6, 7/6) medium SAND and fine GRAVEL; little brown clay.		41-42.5	50	8/6 5/6 4/6	
-43			CL: Brown CLAY; little fine sand to brown CLAY, some yellowish brown medium sand, little fine gravel.		42.5-44	78	3/6 5/6 9/6	
-44			SC: Yellow medium to coarse SAND and CLAY; some medium gravel.		44-45.5	61	7/6 20/6 20/6	
-45								
-46			SC: Yellow medium SAND; some medium gravel; some clay.		45.5-47	75	4/6 9/6 22/6	
-47								
-48			CL: Light gray (10 YR 7/1) to yellowish brown (10 YR 5/4) CLAY; very stiff; some fine gravel; little fine sand; trace silt.		47-48.5	100	50/6 50/6 50/6	
-49			NS: DRILLED THROUGH ROCK				50/5	
-50								



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: SB-7

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-51			GC: Very pale brown (10 YR 7/4) CLAY and medium GRAVEL; some medium sand.		50-51.5	94	34/6 50/6	
-52			CL-SC: Limestone to very pale brown CLAY; some medium sand.		51.5-52	100	50/5 50/5	
-53			GC: Very pale brown (10 YR 7/3) CLAY and fine subangular GRAVEL; some medium to coarse sand; very tight.		53-54.4	100	20/6 25/6	
-54			CL: Very pale brown CLAY; some medium to coarse sand, some fine gravel.		54.5-55	100	50/4 50/5	
-55					56-57.5	28	30/6 60/6	
-56					57.5-58.1	100	32/6 27/6 60/2	
-57					59-59.5	50	100/5	
-58			LIMESTONE: Weathered Limestone					
-59			GC: Coarse GRAVEL; some very pale brown medium sand, trace clay.		60.5-61.5	67	23/6 70/6	
-60					62-63.5	44	29/6 17/6	
-61			GC: Very pale brown medium SAND to pale brown/brownish yellow medium GRAVEL; some clay.		63.5-65	55	13/6 20/6 24/6	
-62					65-66.5	67	42/6 28/6 25/6	
-63			SP: Very pale brown (10 YR 7/3) fine to medium SAND; trace silt and clay.		66.5-68	89	14/6 4/6 22/6	
-64			GC: Brownish yellow (10 YR 6/6) CLAY and GRAVEL; trace silt and sand. Very stiff.		68-69.5	0	29/6 10/6 11/6	
-65			CL: Very pale brown CLAY; some silt; little fine sand; trace medium gravel. Stiff.		70-70.25	100	50/1 70/3	
-66			NS: No Recovery		71-71.8	90	39/6 50/4	
-67			GP: Very pale brown (10 YR 7/3) medium angular GRAVEL and medium SAND; little clay.		72.5-72.7	100	50/2	
-68			GP: Yellow (10 YR 7/6) medium to coarse SAND and medium angular GRAVEL; trace silt.		74-74.2	100	50/2	
-69			GC: Very pale brown medium SAND and medium GRAVEL; some clay, trace silt.		75.5-75.75	100	100/3	
-70			CL-ML: Brownish yellow (10 YR 6/6) CLAY; some silt; trace sand and gravel to very pale brown SILT.		77-77.5	100	100/5	
-71			ML: Light gray (10 YR 7/1) SILT; some clay. Very stiff, very dry.					
-72			ML: Light greenish gray (Gley 2 7/1) SILT; some clay, very stiff, very dry.					

Note: Unless otherwise noted VOC reading = 0.



1319 Woodbridge Station Way, Suite 200
Edgewood, MD 21202
410-538-8202

FORT BUCHANAN PUERTO RICO

Log of Boring: **SB-7**

Depth (ft)	USCS Log	Sample Interval	Description of Materials	Screening	Depth (ft)	Recovery (%)	# Blows per # Inches	Remarks/Sample Name
				VOC (ppm)				
-78			ML: Greenish gray (Gley 2 6/1) to very dark bluish green (Gley 2 3/1) SILT; some clay, very dry, very stiff; some sand at depth.		78.5-79.9	100	20/6 30/6	
-80			GP: Light greenish gray (Gley 2 7/1) coarse SAND and medium to coarse GRAVEL; little silt, trace clay. Wet.		80-80.5	100	60/4 60/5	
-81			ML: Greenish gray (Gley 2 6/1) SILT; some clay, little fine gravel.		81.5-82	100	60/5	
-83			ML: Greenish gray (Gley 2 5/1) SILT; some clay, little fine gravel.		83-83.5	100	100/6	
-85			GP: Greenish gray coarse GRAVEL; some coarse sand and clay.		84.5-84.9	100	100/4	
-86			ML: Greenish gray SILT; little clay, little coarse sand, trace medium angular gravel.		86-86.4	100	100/4	
-88			ML: Greenish gray SILT; some medium to coarse sand/fine gravel; little clay.		87.5-87.9	100	100/4	
-89			ML: Greenish gray SILT; some clay, trace coarse gravel.		89-89.5	100	100/5	
-90			END OF SAMPLING					

[illegible]

[illegible]

[illegible]

[illegible]